POPULAR
Computing
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MAGAZINE OF THE YEAR CTA AWARD
BRITAIN'S BEST-SELLING MICRO WEEKLY

News Desk

QL delays grow day by day

SINCLAIR QL computer delivery schedules seem to be lengthening miraculously every week

First customers for Sinclair's new computer have now all been sent a letter advising them that the company hopes to fulfill orders before the end of April With the 28 day mail-order delivery deadline already up for some orders this could mean a wait of a further nine weeks Says managing director Nigel Searle "We realise that the time between now and then will be frustrating (for customers) but we are confident that the QL will be worth waiting for and of course we will do everything possible to beat our target date for dispatch "

Sinclair is blaming "phenomenal demand" for the delay However it is hard to see how even the most staggering response could have affected the very first orders placed

Some of the 400 customers who had ordered their QL machines by the end of the first day it was announced (January 12) have received letters indicating delivery by the end of April But Sinclair still firmly denies any production problem with the QL

Meanwhile cheques from customers are now being cashed and payed into a special "Readers Trust Account" It remains to be seen what Sinclair will do with the interest accruing from their customers' money while hopeful owners continue to wait

● *Popular Computing Weekly's* own QL order was placed on January 12 and was effected on January 20 Six days have passed since the 28 day mail order deadline has passed and our cheque has been cashed

The new Flan Enterprise

Egg on the face for Flan

ELAN Computers has hit big trouble only six weeks before the first of its under £200 Enterprise computers is due to go on sale

Following legal action taken by other electronics manufacturers the company has been forced to change its name and may yet have to change the name of its computer

From now on the company will be calling itself Flan — rather than Elan — Computers

Marketing manager Mike Shirly said "The name Elan has been registered by another company here and overseas — people often register names without any intention of taking

continued on page 5▶

This Week

ULTIMATE

THE NOT·SO·SOFTWARE





SUNSHINE

The Team

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 re
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This Week

Editorial

The Ministry of Defence s decision to ban a software protection device (*PCW*, 16-22 February) is perverse in the extreme

It is difficult to see how JLC Data's anti-copying system could be considered 'prejudicial to the defence of the realm' Illicit copies of *The Hobbit* and *Flight Simulation* are hardly likely to affect our national defence interests

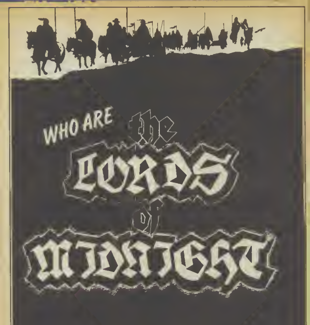
The MOD s Secrecy Order, placed under Section 22(1) of the 1977 Patents Act, appears to be concerned with the fact that JLC's device could prevent anyone, including the MoD, from breaking into on-line data transmissions It is easier to see how the privacy of data communications could be considered vital to Britain's defences — indeed it is rumoured that the government has already developed a similar device for its own use However, this is a side-effect of JLC's system, it is not its main purpose

The main effect of the MoD ban has been to publicise the anti-copying device with all its attendant implications Surely the MoD would have been better advised either to have kept quiet, or to have persuaded JLC to start working for the government

It can only be a matter of time before someone comes up with a similar invention, be it in the UK or overseas Knowledge is not an easy thing to ban

Next Thursday

Eat as many fish as you can before you die of starvation, but avoid the deadly octopuses who will crush you See Attack — next week's star game for BBC B by Mark Gisley


WHO ARE
the
LORDS
of
MIDNIGHT

Undaunted by MoD

JLC DATA the cassette duplication company which has had its anti-piracy invention banned by the Ministry of Defence (see *Popular Computing Weekly*, February 16), remains undaunted

An earlier development of the same recording technique which is unaffected by the MoD's secrecy order, has now been recommended by the Guild of Software Houses (GOSH) for use by its members

In this simpler version of the protection device, the 'imprint' signal used to protect the software canbe heard as an audible tone on the tape, unlike the technique which is the subject of the MoD ban

JLC's Jim Lamont sees little hope of regaining control of more recent work "I fear we have lost it for good " Under the terms of the prohibition order issued under Section 221(1) of the 1977 Patents Act by the Patent Office such a ban can be applied to any development which could be "prejudicial to the defence of the realm"

It could take as long as mid-1985 before the MoD's Inventions Unit even begins to consider the JLC case

It is difficult to discover the reason for the government action A similar case in the US, where the National Security Agency stifled the effectiveness of an electronic fund transfer data protection device was apparently the result of the NSA not wishing to have a system developed which it could not itself crack

Mr Cole at the MoD's Inventions Unit at Fleetbank House, Salisbury Square in London declined to comment Mr Kennard at the Patent Office suggested another number for press information "I'm sorry to have to ask you to ring someone else, but these are my instructions at the moment — it will be better in the long run "

And so to Betty Powell "I'm afraid I can't discuss individual cases When the MoD receive details of the invention they will assess it and either revoke the order or keep the invention secret There is no way round the procedure I agree that under the powers of the Act an inventor could feel unhappy, but you can see that it is necessary for the MoD to be able to do this "

Jim Lamont of JLC Data, whose anti-copying device has been banned by the MoD
An earlier version of the system is now being recommended by the Guild of Software Houses.

Flan

continued from page 1

them up

'The change from Elan to Flan was the easiest for us to do — some people have been calling it the Flan computer anyway "

Name wranglers seem to have dogged Elan since the start Even before the computer was officially announced last year it had suffered one name change — originally it was known as the Samurai micro, manufactured by Samurai Computers A brief legal tussle with a company system under the name of Samurai encouraged the search for a new name and the Elan Enterprise was born

● Flan is rumoured to be on the verge of announcing a multi-million pound manufacturing deal for producing the Enterprise in the UK

Mail-order Lynx

FROM mid-March, Camputer's 48K Lynx will no longer be sold through high street shops

Instead, the machine — to be renamed the Lynx Leisure — will be available only by mail-order direct from Camputers for £159 99 — a saving of £65 on its present price

At £225 the machine had not been selling and the retreat to mail order is a quick way to cut the price

The Lynx 96K is faring somewhat better at £299 and will continue to be sold in branches of Dixons Laskeys and Spectrum Stores

Camputers' delayed 128K Lynx Laureate is now scheduled for March, priced at £399 95 for the Basic machine and £995 for a system with CP/M twin disc drives and a suite of business software packages

New series from Beeb

THE BBC is to screen a new series of micro programmes — *Computers in Control* — beginning in March

The five 25-minute episodes will look at control applications for computers including robotics and automated assembly

Each programme will be broadcast three times Two of the showings will be at lunchtime beginning March 2 The third showing will be a weekly evening slot at 11 30pm beginning on March 8

PCW award

Popular Computing Weekly is proud to announce it has been awarded the title 'Magazine of the Year' by the Computer Trade Association

Atari offers Logo package

VERSIONS of the Logo computer language are popping up all over the place

Atari is now offering its Logo cartridge, which sells for £59 99 as part of a special schools package The package, consisting of Logo plus an Atari 600XL computer, will be sold to schools for £201

On the Spectrum, Kuma Computers has developed a Logo graphics utility which will sell for £9 95 Details from Kuma, 12 Horseshoe Park, Pangbourne, Berkshire

Emulator for QL

A SPECTRUM emulator for the new Sinclair QL computer would be an interesting device

Using it any ZX Spectrum program could be run on the QL, instantly giving the machine a wealth of available software

Sinclair itself has no plans to offer such a software emulator, so Joe the Lion, based in Cheshire, has stepped in It has announced it is working on a combined Spectrum emulator and cassette interface for the QL enabling any Spectrum machine code cassette to be loaded and run

Explained Lawrence Holt "It will be some time before our *Emulator* program is in production — although we have a QL, we are hampered because changes may still be made to the machine's Rom The complete package of emulator software on Microdrive cartridge and hardware interface to connect the cassette player should cost around £25

Joe the Lion can be contacted at 213-215 Market Street, Hyde, Cheshire

It is unlikely that many programs written specifically for the QL, commented "If anybody even if a low-cost cassette interface is offered Nigel Searle commented at the QL launch that a machine of the power of the QL was not well suited to a cassette based system

David Potter, managing director of Psion, the software house responsible for the four programs supplied with the QL, commented 'If anybody wants to put out cassette games they could easily produce a low-cost hardware interface but they'd be crazy to do so With Microdrive software I do not expect to lose more than 4 or 5 per cent through piracy and home taping

"I do not think availability of the Microdrive cartridges will prove a problem either — Sinclair is gearing up production to the most extraordinary level and, next year, other companies will be making them too "

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Name
Address

Letters

Blank reviews

It has come to my attention that while *PCW* and all the other computer magazines have been reviewing software cassettes, as yet there have been no reviews for blank cassettes

I have experience of three makes of cassette WH Smith C15, which has never lost a program, Boots C15 of which my cassette player makes a tasty meal thus rendering the cassette useless, and EMI C20, better value than the others per minute but dearer by 9p

Perhaps other readers have preferences for or complaints against any particular brands of computer cassette?

Andrew Wiseman
68A Mayfield Road
Hartford
Huntingdon
Cambridgeshire PE18 7NJ

Conned by whom?

So your correspondents John Wheatly believes he has been conned by the microcomputer industry? More fool he!

If he had examined his own ideas a little more thoroughly before parting with his cash he would have found no advertising claiming that micros can (a) feed 5000, (b) walk on water, (c) heal the sick or (d) make him more intelligent All these, and more, are products of his own imagination

Had the micro he bought possessed property (d), he would have realised that the home computer has more in common with the TV set through which it operates than with any sci-fi device aimed at saving the world

I note with interest that he does not possess an electric train set Perhaps this is indicative of the type of man we are dealing with

I think Mr Wheatley is the type of man who feels that everything in life should have a purpose, but contrives to ignore some purposes completely He should take part-time work to busy his idle hands rather than meddle with micros, which are aimed at people's leisure hours Obviously, he believes leisure to be simply wasting time and needs to be 'doing something useful' all the time Programming is not enough for a man of this bent — for what does the program *do*? Has he gained from his micro one solitary slice of toast or pound note? No! Conclusive evidence exists that micro-computers are incapable of performing the simplest tasks such as making toast or printing money (without the right peripherals!)

I wonder how he would have coped born into an earlier age, faced with that dazzling innovation, the television? He would most likely have bought one, but bemoaned the fact that it had not improved his spots or dandruff

On the subject of computer magazines, these are published to satisfy the needs of those who are interested in computers Mr Wheatley evidently has no use for publications of this kind In fact, reading is a rather pointless exercise for a man of action like JW I bet he stays awake at night trying to think of ways to utilize all those hours wasted sleeping!

My computer has brought me many hours of amusement, which would otherwise have been wasted doing homework I have learnt programming, made sense of 'O' level maths, and made a lot of new friends from this satisfying hobby

As for owning a computer making anyone 'clever or wise' — most of us were wise enough to realise just what a computer could do before buying one!

Gill Hesketh
379 Liverpool Road
Eccles
Manchester
M30 7HB

Taking advantage

We think it a sad reflection on the character of some of your readers that they find it necessary to take advantage of those unfortunate enough not to have been included on Sinclair's 'magic list' We refer to those who offer for sale Microdrive order forms, which they themselves obtained free of charge We gave ours away

Phil Stenton
Chris Fife Schaw
Dept of Psychology
University of Sheffield

We could not agree with you more and would like to thank you and everyone else who brought this matter to our attention. *PCW* will no longer be accepting advertisements offering Microdrive order forms for sale.

Orange mistake

I noticed a mistake in my article *Orange* in *PCW* 26 January-1 February The 3rd byte in line 38 should read Ø not 255 Luckily, this only prevented the colouring of the last three bytes in the attribute file

Simon Cox
51 First Ave
Dunstable
Beds LU6 3AJ

In total agreement

As a devoted reader of your 'weekly micro mag' (yuk) there are some things in it which interest me more than others I religiously read Tony Bridge (by the way, what has happened to the Helpline column), the games reviews, New Releases and This Week, also the letters page

Not being a computer programmer (yet), I scan the rest of *PCW* for any relevant information But, what a lovely surprise to find in Ziggurat, something I seldom even glance at, someone else with the same views as I have

Why is it that the computer industry is so patronising about women and computers? No survey has ever asked me, or anyone I know how I feel if I have a computer, what kind of games I play, etc

I totally agree with Jane Stoneham (*PCW* 9-15 February) regarding adventure games — all the women I know with computers which range from the BBC B through the Spectrum to the Commodore are adventure mad Personally, I have finished *Knight's Quest*, 75 percent of *the Hobbit*, *Pimania* ¾ of *Black Crystal* and am on *Magic Mountain* at the moment The Arcade games that interest me are *Ah Diddums Atic Atac Manic Miner* and *Penetrator* If any survey company reads this, I think you are asking the wrong women

Mrs M Roberts
15 Ruffa Lane
Pickering YO18 7HN

PS I'd like to see more of Jane Stoneham in *PCW*

Jane Stoneham's article certainly attracted a great deal of interest. Perhaps some of our other readers would like to write in with their views on the subject.

As for the Helpline column, apologies to everyone who has sent in entries. Normal service will be resumed shortly.

"From the Ministry of Defence about my invention. What is it — a contract or a secrecy order?"

Puzzle solvers

I refer to David Senior's letter in *PCW* 12-18 January I too tackle the puzzle every week and religiously send a postcard with the solution to *PCW* (I've never won)

Some puzzles I find are extremely easy to solve — having developed a set of programs to suit each case — others not so

I timed myself solving puzzle No 86 and it took me five minutes thinking time one minute programming time and 0 9 seconds program running time, which is a personal best (Spectrum)

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VALHALLA



Hot Drop

A new game for BBC by Ken Swallow

Land the Commando helicopter in the dangerous valley, dodging the shots from the enemy fort

The development of programs like this, as with various 'lander' and 'bombrun' programs can be a useful learning exercise Each of the early stages illustrates a simple element of programming

a) defining a character that can be positioned at text *Tabs* or graphics co-ordinates
b) *Drawing* a landscape
c) *Printing* a set of instructions
d) and then the main loop (from line 320 to line 550)

Putting in the shots was the most complex part The *Shootback* is a flamboyant ending for the successful landing It can be omitted or reduced The main variables are

X Y	–	craft's co-ordinates
F	=	shot flag (F=1 releases a shot)
P p	=	determine position and sub-position of the shot
C D	–	factors determining 'gradient' of shot
K$	=	input from player

Once the player has found the safe way(s) down the appeal of the game may pall but there's plenty of room for the programmer to develop it

With a little ingenuity, a random element could be introduced into the shots — a squad of helicopters could be assembled — to be landed in turn — to demolish floors of the fort one at a time — a ranking table could be constructed for successive players





```
>L.
10 REM ********************************
20 REM  'HOT DROP'   by Ken Swallow
30 REM  and MD1/2y,People's College
40 REM ********************************
50 MODE 2
60 REM ================
70 REM  THE 'CHOPPER'
80 REM ================
90 VDU 23,200,255,24,24,60,60,126,90,90
100 VDU 23,210,90,126,60,24,60,102,66,195
110 REM ================
120 REM    LANDSCAPE
130 REM ================
140 COLOUR 132:CLS
150 FOR M = 1 TO 5
160 MOVE 440,20:DRAW 200+RND(100),M*40
170 IF M<3 THEN DRAW 0,M*90 ELSE DRAW
    130,250:DRAW 0,250
180 MOVE 840,20:DRAW 900+RND(200),M*40
190 DRAW 1280,M*90:NEXT M
200 VDU 24,440;5;840;25;:GCOL 0,130:CLG
210 COLOUR 4:COLOUR 134:PRINTTAB(0,19)
    :':;"'"::'"::'"::"'"::"
220 REM ================
230 REM  INTRODUCTION
240 REM ================
250 VDU 28,2,20,17,3:COLOUR 132:CLS:
    COLOUR 1:PRINT''    HOTDROP"
260 COLOUR 7:PRINT''"Land the chopper
    in the valley"''"Watch the shots
    from the fort"
270 COLOUR 3:PRINT'" The controls
    are:":COLOUR 1:PRINT'"   LEFT =
    'Z'"'"   RIGHT= 'X'"
280 COLOUR 2:PRINT'"  Press  space"'"
    bar to start":G=GET:COLOUR 132:
    CLS:VDU 26
290 REM ================
300 REM  THE 'ACTION'
310 REM ================
320 VDU 5:LET X =640:C=1.45:D=0.25:F=0
330 FOR Y =1000 TO 100 STEP -25
340 IF INT(Y/100)=Y/100 AND Y>100 THEN
    C=C-D:P=120:F=1
350 IF Y<600 THEN D=0.2
360 IF Y<100 THEN F=0
370 IF X<40 THEN X=40
380 IF X>1200 THEN X=1200
390 GCOL 0,3:MOVE X,Y:PRINT CHR$(200):
    MOVE X,Y-32:PRINT CHR$(210)
400 IF Y<(450-X) OR Y<(X-840)
    THEN PROCBANG
410 REM ================
420 REM   THE SHOTS
430 REM ================
440 IF F=0 THEN 520
450 FOR p=P TO P+240 STEP 30
460 IF 390+(p-120)*C>40 THEN GCOL 0,1:
    MOVE p,390+(p-120)*C:PRINT"*":SOUND
    0,-12,4,1:K=INKEY(4):GCOL 0,4:MOVE
    p,390+(p-120)*C:PRINT"*"
470 IF p>X-20 AND p<X+20 AND 380+(p-120)
    *C>Y-45 AND 380+(p-120)*C<Y+15
    THEN PROCBANG
480 NEXT:LET P=p
490 REM ================
500 REM   MOVEMENT
510 REM ================
520 K$=INKEY$(10)
530 GCOL 0,4:MOVE X,Y:PRINT CHR$200:
    MOVE X,Y-32:PRINT CHR$210
540 SOUND 1,-12,200-Y*4,2
550 IF K$ ="Z" THEN X =X-50
560 IF K$ ="X" THEN X =X+50
570 NEXT Y
580 *FX 15,1
590 REM ================
600 REM  THE SHOOTBACK
610 REM ================
620 GCOL 0,3:MOVE X,90:PRINT CHR$(200):
    MOVE X,58:PRINT CHR$(210)
630 FOR COL=8 TO 11:VDU 19,COL,
    6,0,0,0:NEXT
640 K=INKEY(70)
650 FOR S=1 TO 3
660 GCOL 0,5:MOVE X-20,70:DRAW 80,350:
    SOUND 0,-15,4,7:PROCdot
670 GCOL 0,4:MOVE 80,350:DRAW X-20,
    70:PROCdot
680 NEXT S:PROCdot
690 VDU 19,6,4,0,0,0
700 FOR COL=8 TO 11:VDU 19,COL,COL,
    0,0,0:NEXT
710 FOR COL=12 TO 15:VDU 19,COL,
    4,0,0,0:NEXT
720 FOR a=0 TO 2*PI STEP PI/12:GCOL 0,
    (11+RND(3)):R=70+RND(140):PROCflash
    (90,370):R=2*R:PROCflash(100,300):NEXT
730 FOR COL=13 TO 15:SOUND 0,-COL,6,
    14:VDU 19,COL,COL,0,0,0:NEXT
740 K=INKEY(400)
750 VDU 19,6,0,0,0,0
760 FOR COL=8 TO 15:VDU 19,COL,
    4,0,0,0:NEXT
770 K=INKEY(200):VDU4:VDU 28,2,8,17,5:
    COLOUR(128+RND(3)):CLS:COLOUR 0:PRINT
    "Press space bar to restart":G=GET:RUN
780 END
790 REM ================
800 REM   DISASTER !!
810 REM ================
820 DEFPROCBANG
830 *FX 15,1
840 VDU 24,X-50;Y-50;X+50;Y+25;:GCOL 0,
    132:CLG:VDU 26
850 GCOL 0,3
860 MOVE X,Y+50:PRINT CHR$(200)
870 MOVE X,Y-70:PRINT CHR$(210)
880 FOR bit=1 TO 70
890 SOUND 0,-12,5,1:GCOL 0,RND(7)
900 PLOT 69,(X-15)+RND(100),(Y-100)
    +RND(200)
910 NEXT bit
920 K=INKEY(200):VDU4:VDU 28,2,8,17,5:
    COLOUR(128+RND(3)):CLS:COLOUR 0:PRINT
    "Press space bar to restart":G=GET:RUN
930 ENDPROC
940 DEFPROCdot:FOR d=1 TO 50:GCOL 0,
    (7+RND(4)):PLOT 69,RND(128),
    250+RND(160):NEXT:ENDPROC
950 DEFPROCflash(A,B):MOVE A,B:DRAW
    A+R*COS(a),B+R*SIN(a):ENDPROC
```

Putting on the style

***David Kelly** talks to Psion's team of programmers working on the new Sinclair QL micro*

Everyone who buys a Sinclair QL will receive as well as the machine, four applications software packages written by Psion

Writing the programs — *Easil* (a graphics package), *Quill* (a wordprocessor), *Abacus* (a spreadsheet) and *Archive* (a database) has been a major undertaking for a young company like Psion

Sinclair approached Psion and several other companies — rumoured to include both Digital and Microsoft — at Christmas 1982 with a view to developing material for its new professional machine

Psion is an ambitious company and we aren't into producing specialist programs to keep legal records or patient dose rates We wanted instead to be producing the funbamental software tools — the word-processors and spreadsheets — a market dominated by the big US software companies explains managing director, David Potter

"We had long discussions with Sinclair and the four QL programs are the first fruits of our joint agreement They take the hardware to its limits and I think we surprised Sinclair with what we have achieved The market doesn't know yet what we have done — as yet there have been no review machines available to the press

"But the four packages are state-of-the-art products Better more powerful and conceptually more advanced than anything on any machine costing under £5000 *Archive* is probably the most powerful database program on any micro, full stop

"It has been a huge effort for us Frankly, this is why we haven't been coming out with too many home computer products recently

Work on each of the QL programs was co-ordinated by a project leader The four individuals were Martin Brown (*Easil*) Martin Stamp (*Quill*), Colly Myers (*Abacus*) and Charles Davies (*Archive*) Each of the packages is designed at a fundamental level to be immediately accessible to a beginner This is achieved by what Psion describes as 'their pyramidal structure' Every parameter in the programs that can be selected by the user has a sensible default mode

When any of the programs first appears on screen, it is ready for use in a form that is calculated to be the one most frequently desired in all four, the function key F1 is a Help facility *Help* is intelligent in that it will give you information related to what you were trying to do when your pressed *Help*

'We spent about two months just thinking about how people draw graphs before starting on *Easil*" says Martin Brown "The way most graph packages work is you type in lots of data and it asks you very many questions about what colour bars you want for your histogram and so on With *Easil's* built-in defaults, all these are already answered for you The first thing you do is key in the numbers and up comes the graph straight away scaled for you "

The graph is then named The command *Newdata* clears the screen for the next graph A particular graph is presented using the *View* command, eg *View Costs.*

Built-in word count

Different sets of data are shown as different colour bars or lines, or pie charts You can enter formula If you have two sets of data *Costs* and *Sales*, you can type in *Profit=Sales-Costs* and you will instantly get a third graph on screen labelled *Profits* All the mathematical symbols can be coped with Graphs can be annotated The computer looks at what you type in and decides if it is a text label If so cross-wires are presented on screen and moved with the cursor keys to position the text In text mode there is a full line editor built in

Going deeper into the program different bar and line types can be selected from a pictorial menu Deeper still, you can design your own bar Moving the cursor and pressing the function key *F4* will delete bars *Change* allows you to modify individual bars or lines *Highlight* points up a particular value in a different colour *Kill* kills whole graphs

Psion's team (from left to right) Charles Davies, Martin Brown, Colly Myers and Martin Stamp

When a graph is finished, it can be *Exported* to the data base, spreadsheet or wordprocessor

Quill, the wordprocessor, is just as easy to use To start, hit any character on the keyboard and up comes the screen ready for you to begin typing Says Manin Stamp "There are no control symbols on screen at all — what you see is what you get " So off you go typing away Text is automatically continued on to the next line Carriage return sets the new paragraph — indented for you There is a built-in word, line and page count. *Insert* allows new text to be added at a point selected by using the cursor keys Inserting one word the text is automatically justified, more than one word breaks the text apart. Hit any key apart from characters or delete and it will heal the break, justifying the text appropriately

At a deeper level in the program you can set margin width and page height *F4* chooses type style — normal bold underlined, superscript or subscript

Text can be displayed in 80 64 or 40 characters per screen *Justify* will produce text justified left, right both or centred You can insert headings and footnotes page numbers are either arabic, roman or alphabetic Page-breaks are displayed dynamically *Goto XXX* will jump to the start of page XXX of the document *Search* and *Replace* are obvious *Merge* joins two documents *Glossary* gives the facility to recall a string of key depressions Pressing shift *F5* and a letter followed by text defines a glossary term This can then be recalled in a document by pressing *F5* and the letter Up to 26 *Glossary* terms can be defined in this way each up to 50 characters in length Commands such as margin settings can also be stored using *Glossary*

The spreadsheet is a more specialist program giving basic accounting and yearly financial projections Consequently *Abacus* is slightly more difficult to come to grips with than the other two programs Abacus calculates in whole rows You give it a figure — say for January sales — and a single mathematical relation, and it will automatically produce sales figures for the whole year Typing a single equation for the relation between sales and profits will instantly produce a whole new row of monthly profit forecasts "All this can be achieved without typing a single command — I have tried to combine the style of *Supercalc* with the power of *Multiplan*" says Colly Myers

At a deeper level there are 35 command words to help the budding accountant find the wood from the trees

You can choose integer, decimal or exponent representation of the figures Like the wordprocessor the display can be set to 80 64 or 40 coloumns *Amand* allows you to change any of the formulas you have used in the projections A full line editor is incorporated *Copy* allows you to copy any portion of your figures elsewhere in the grid

You can delete row or columns *Merge* allows different spreadsheets to be concatenated *Window* allows the grid to be split up *Lookup* allows you to develop a look-up table say, of tax values The maximum size grid is 64 x 256 cells. Spreadsheet tables can be saved or exported to *Easel Archive* or *Quill*

Finally, the most complex and powerful program of the suite is the database — *Archive* Fundamentally the program has to

. . . specialist packages

cope with a wider range of applications than the others and *Archive* can be customised by the user, other software houses can easily adapt it to produce more specialist packages *Archive* also comes with a selection of programs written with it including a simple cardfile program

"We looked at other packages before starting on *Archive* Usually they are a pig to work with — a third-degree setting up fields, fixing record lengths and dealing with many different data types," explains Charles Davies

Psion's program gets round these drawbacks by offering a totally variable record length and only two types of data — strings and numbers

You can get started with just a few commands *Create* creates a file Then you simply use the cursor keys to move around the screen typing in the file labels variable slots and variable lengths It is as easy as using the cursor keys and typing

When you have set up your file of records life begins to get interesting *Archive* contains its own file searching language in witich you can write programs and even define procedures. *Back Next*, *First* and *Last* move you through the records *Find XXX* searches for the string *XXX* in any file Imagine a database of the countries of the world listing populations and other important data Using Archive the instruction *Select continent$="Europe" And Pop>20* will find countries in Europe and populations greater than 20m

A more complex program (a procedure of eight lines) can easily rearrange the complete file of records in order of decending population "The language is easier to use than Basic," says Charles "There are about 90 key words but you only need a couple to get started"

More than one file can be open at once making *Archive* a true multi-file relational database Its procedure editor has two windows — one shows the procedure menu, the other lists the procedure next to the cursor on the menu *Tab* and *Shift Tab* move the cursor up and down the menu listing each of the procedures F5 brings a selected line from the given procedure down for editing with the editor *Cut* and *Paste* allow parts of one procedure to be taken and inserted into another Tables can be shipped out from *Archive* to the Word processor

"The database gets its power from the fact that it is really a computer language — the *Archive* language

Follow that! Well Psion will With more programs for the Spectrum and BBC and with more programs for the QL. Likely candidates on the QL are compiled languages — possibly Fortran — and games

"It is the greatest games machine I have ever seen," says David Potter Games for the QL will have to be good though, just because of the quality of the machine Compare its resolution of 512 x 256 with the 256 x 192 of the Spectrum You have two-and-a-half times as much data to move around the screen And unlike the BBC machine it has enough memory to run a decent game"

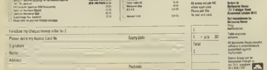
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..the name of the game
Imagine Software Limited

Anyone for Denis?

***Tony Kendle** goes on the trail of the hidden booze in this round-up of Spectrum adventures*

There has been a dramatic increase lately in the amount of adventure game software available for the Spectrum However with the exception of glamorous programs like *Valhalla* and one or two company names such as Level 9 or Digital Fantasia that always mean excellent quality there is often little to guide a prospective buyer towards games that are value for money — hence the need for magazines like *Micro Adventurer*

Writing adventures does not require any great programming feats especially since the appearance of *The Quill* (the adventure writing utility sold by Gilsoft) Good ideas and good plots make good adventures and these are not the perogative of large established software houses So, this week I would like to look at a recent collection of games from a range of companies including some less well known ones

Among these adventures are two programs produced using *The Quill* and the first of these — *Magic Castle* — was specifically written for Gilsoft to market Unfortunately it looks the part of a set up job because although competent it lacks atmosphere or conviction and I found it less than gripping By trying to illustrate the potential of *The Quill* as much as possible it manages to show the program s limitations as well as its plus points

For example I was annoyed to find the message I am thirsty flashing up on the screen just two moves after I had drunk from a fountain thus forcing me back to drink again It should not have been too difficult to set a flag so that this particular not very taxing problem did not appear if a drink had just been taken Added to this are some spurious booby traps and puzzles that are neither difficult exciting or relevent to the scenario My opening moves in a game set in a time of castles and princesses found me lost within a minefield clutching an exploding football

The package is topped off with a very rushed looking cassette inlay and the minimalist note 'Rescue the princess and avoid the bodby traps and vampires which is in stark contrast to the hefty tomes that accompany some adventures these days On the bright side things do improve and the problems do become more interesting, but it is still nothing that will revolutionise the adventure world More thought more consistency and a lot less of the arbitrary traps could have made it a much better game

Denis Through The Drinking Glass is the game that Gilsoft should have chosen to promote *The Quill* The originality and creativity of this adventure illustrates what a boon the adventure utility really is I don t know anything about the author but I venture to suggest that he is not a programming genius And yet thanks to Gilsoft, we are presented with a rapid-response superbly complex game that is great fun to play No longer must we rely on 12-year-old whizz kids or mathematicians — no offence — for our entertainment because the more artistically minded can now enter the fray



Denis is a wacky sideways look at the world of politics through the G and T sodden eyes of one *Denis Thatcher* — the concept appears to owe more than a little to the *Dear Bill* columns of *Private Eye* Each location is described in rhyming couplets and you are faced with many very difficult problems the most pressing of which is to avoid Maggie and find where the booze is hidden

If *Denis* doesn t get a drink within 10 moves the shock of reality proves sufficient to polish him off and even when you do find some it is a good idea to keep an eye on the number of lums you take because the danger of sobering up is always present

I am sure the originality of the game is the root of its difficulty because the stock problems and stock solutions simply do not appear For instance what is the correct move when facing Keith Joseph or Ken Livingstone — none of your kill dragon stuff works here — and wonder of wonders an adventure game where you don t have to carry a source of light

The help clues are also original — most of them manage to be a single terse insult and yet also be a relevent clue However the best part of the game must be the replicas of the *Sun* newspaper that appear following any insignificant wrong move complete with appropriate headline For instance step outside No 10 without dressing and you soon learn what it is like to be a page 3 girl One helpful hint the program does not understand the words *Search* or *Examine* — you have to *Look* object or room

An excellent game and I look forward to the follow-up *Tebbit* with anticipation

***M**urder at the Manor* from Gemtime initially struck me as less of a prize It is one of those graphic adventures where box like rooms and buildings take ages to appear and yet add nothing to the atmosphere or enjoyment I would much rather the memory had been better used to give more rooms less terse text and a faster response time

The arrangement of the various locations was one of the most difficult to follow that I have seen, with many of the directions all leading to the same place This would have been less of a problem if it were not for the increasingly irritating wait for the pictures to redraw themselves However once you have adjusted to the peculiar map and the slow pace of the game there are some nice features

You play the role of a detective trying to solve a murder mystery The opening scenario is a small village where you wander the streets looking for useful objects very necessary food parcels and the way out This initial problem of finding your way to the manor itself is no joke and there is the added complication of maintaining your energy levels long enough to get there

On your way around, you meet characters that you can ask for clues fight or regard as suspects although there are some that you would do well not to tangle with — such as a very vicious rat There is

therefore a limited degree of interaction between the characters — and the adventure also measures the passage of time with some noticeable differences between night and day Later stages of the game take you through the countryside to a graveyard and then to the manor itself Here you find the victim the Lord of the Manor and also some suspects which traditionally include the gardener and the butler

One advantage of the game is that a new murderer is chosen every time you play so you can never quite predict what will happen Personally I think the rat did it

The program is written in Basic which makes it even slower and I was unhappy to find that should you die you have to reload at least parts of the program before you can start again However despite this, the game is worth playing

Mountains of Ket from Incentive Software is another game that offers interactive characters This is the first part of a trilogy of text adventures that involve the same central character Here you have the relatively simple aim of reaching the other side of the Mountains of Ket but in the later games you will have some magical despots to destroy

At the beginning you are awarded various points representing your fighting prowess energy and luck and these largely determine your chances of winning any combat you enter into All the characters you meet including your trusty horse can be fought and the result is that even when you can't solve a certain riddle such as finding the password you can fight your way through to new locations However this does make it hard to know when there are puzzles to solve and when fighting is supposed to be inevitable The prowess of the opponents also varies from game to game and the outcome of a fight is truly unpredictable One thing I am unhappy about is the gory description of the combat but perhaps this is designed to stop you being over aggressive

The opening scenes find you by a village with some not too difficult problems to solve before you obtain enough provisions and can proceed to the mountains A word of advice — don't fight the villagers

Answers to the many puzzles are not easy to find and everything is complicated by a rat that can appear at random times and carry off any object that you drop

The programming of this adventure is very professional with a nicely designed layout and each object represented by a small graphic Response is fast as is the action of the combat sequences and the game is well error trapped with most possible commands anticipated There are inevitably, certain objects within some rooms that the computer does not recognise, but generally this is a very polished adventure with some nice ideas

Incentive Software is aptly named because it promises that it could be to your advantage to score 100 per cent but anyone who scores maximum points on all three games will deserve a prize

Finally I would like to go off on a slight tangent to look at *Atic Atac* from Ultimate There are many games that claim the title of arcade — adventures but the only ones that I have seen that deserve this accolade are *Halls of the Things* and *Atic Atac* This is because they are both games that require thought and caution in order to succeed

Of the two *Atic Atac* sticks most closely to a [illegible] adventure format You are given a quest to find the three parts of a key needed to escape the haunted house where you are trapped On your way around the various locations which you are strongly advised to map you discover objects that help you enter different rooms or destroy certain monsters

All the time you are under attack from a collection of ghouls ghosts pumpkins and the like You can battle these in different ways depending on which character you have decided to be from a choice of knight wizard or serf Each of these not only possesses different weapons but also has access to different ways of travelling between rooms I don't intend to reveal the details here, but I will say that like all good adventures there is a logic to these secret passages and the use to which the objects you find can be put

The game is presented in superbly animated arcade action with bold and colourful sprites of cartoon quality The pictures of the different rooms are excellently drawn and page almost instantaneously as you charge from one to the next The sense of humour that pervades the game is demonstrated by the fact that your current energy status is represented by the state of a huge roast chicken on the side of the screen — when the chicken is reduced to a heap of bones then you reach the end of your current life

The only criticism I would make is the choice of the *QWERT* keys to control the character

I know that hardened adventure fanatics are supposed to look down on arcade games but I would not be surprised if some were made to think again after seeing this program

In summary not only the quantity but also the style and content of adventure games available are reaching new heights and with the mass market of Spectrum owners available this trend should intensify over the coming months I think we can look forward to some great things and it is not necessarily going to be established software houses that lead the field

Firm	Program	Price	Value (1-10)
Gilsoft 30 Hawthorn Road Barry S Glamorgan	*Magic Castle*	£5 95	6
Applications Software Dept PCWK 8 St Pauls Road Peterborough PE1 3DW	*Denis through the Drinking Glass*	£5 50	9
Gemtime 16 Ben Ledi Road Kirkcaldy	*Murder at the Manor*	£6 95	7
Incentive Software 54 London Street Reading RG1 4SQ	*Mountains of Ket*	£5 50	8
Ultimate The Green Ashby-de-la-Zouch Leics	*Atic Atac*	£5 50	10

Dial 7 for murder

R W Tinman clocks the digits on your BBC B

This program runs on a BBC model B or upgraded model A I used mode 2 graphics to draw two digits Each digit has seven segments, like some digital clocks and watches Each segment is drawn in a different colour The colours can then be changed to form a number This is done with the *VDU19* command The digits can then be made to count up in seconds 10th of seconds or 100th of seconds

The variables are as follows



COL%	Colour of digits
BCOL%	Screen colour
LCOL%	Border colour
S	Scale of digits
TI	Time take for each count (in 100th of sec)
X%	Number of counts
D$(10)	Segment pattern for numbers 0 to 9
Q	Vertical position of digits
W	Horizontal position of digits

The following lines should read

530 FOR W% =1 TO 14 VDU 19 W% BCOL% 0 0 0 NEXT
550 FOR W% =1 TO 7 VDU 19 W% BCOL% 0 0,0 Next N%= .etc

```
10 REM*******************************
20 REM***   7  SEGMENT DISPLAY   ***
30 REM*******************************
40 REM***      by R.Tinman       ***
50 REM*******************************
60 REM
70 MODE2
80 VDU 23;8202;0;0;0;
90 COL%=1
100 BCOL%=0
110 LCOL%=3
120 S=2
130 TI=100
140 X%=0
150 VDU 19,0,BCOL%,0,0,0
160 DIM D$(10)
170 D$(1)="123567":D$(2)="36":D$(3)=
   "13457":D$(4)="13467":D$(5)="2346"
180 D$(6)="12467":D$(7)="124567":D$(8)
   ="136":D$(9)="1234567":D$(10)
   ="123467"
190 Q=0:W=100:VDU 29,Q;W;
200 PROCBORDER:PROCVDU
210 READ A,B,C,D,E,F,G,H,CO
220 CO=CO+7
230 PROCDRAW(Q,W,CO)
240 IF CO=14 GOTO 260
250 GOTO 210
260 Q=80*S*4:VDU 29,Q;W;
270 RESTORE 440
280 READ A,B,C,D,E,F,H,CO
290 PROCDRAW(Q,W,CO)
300 IF CO=7 PROCNUMBER
310 GOTO 280
320 REM
330 REM*******************************
340 REM***       PROCEDURES       ***
350 REM*******************************
360 REM
370 DEF PROCDRAW(X%,Y%,C%)
380 GCOL0,C%
390 MOVE A*S*4,B*S*4
400 DRAW C*S*4,D*S*4
410 PLOT 85,E*S*4,F*S*4
420 PLOT 85,G*S*4,H*S*4
430 ENDPROC
440 DATA 27,90,75,90,37,83,64,83,1
450 DATA 19,54,27,88,27,58,33,83,2
460 DATA 61,58,67,83,67,54,75,88,3
470 DATA 61,55,67,51,26,55,18,51,4
480 DATA 67,51,58,48,18,51,24,48,4
490 DATA 6,3,18,48,15,8,24,45,5
500 DATA 52,9,59,45,58,4,66,48,6
510 DATA 7,0,57,0,17,6,50,6,7
520 DEF PROCVDU
530 FOR N%=1 TO 14:VDU 19,N%,0,0,0,0
   :NEXT
540 ENDPROC
550 DEF PROCNUMBER
560 PROCCHANGE(X%)
570 SOUND 1,-15,200,4
580 PROCCHANGE(X%)
590 X%=X%+1
600 IF X%>59 X%=0:SOUND 1,-15,200,2
610 TIME=0:REPEAT UNTIL TIME>TI
620 GOTO 580
630 ENDPROC
640 DEF PROCCHANGE(O%)
650 FOR W%=1 TO 7:VDU 19,W%,0,0,0,0
   :NEXT:N%=VAL(RIGHT$(STR$(O%),1))
   :N2%=VAL(LEFT
$(STR$(O%),1))
660 FOR W%=1 TO LEN(D$(N%+1))
670 V$=MID$(D$(N%+1),W%,1)
680 V%=VAL(V$)
690 VDU 19,V%,COL%,0,0,0
700 NEXT
710 IF N%<>0 ENDPROC
720 FOR W%=1 TO LEN(D$(N2%+1))
740 V$=MID$(D$(N2%+1),W%,1)
750 V%=VAL(V$)
760 VDU 19,V%,COL%,0,0,0
770 NEXT
780 ENDPROC
790 DEF PROCBORDER
800 W=W/4
810 VDU19,15,LCOL%,0,0,0:GCOL0,15
820 MOVE S*4,S*4-W:DRAW S*4,90*S*4+W
830 DRAW 80*S*6+75*S*2,90*S*4+W
840 DRAW 80*S*6+75+S*2,S*4-W
850 DRAW S*4,S*4-W
860 MOVE 80*S*4,90*S*4+W
870 DRAW 80*S*4,S*4-W
880 W=W*4
890 COLOUR 15:PRINT TAB(1,2);"7
   SEGMENT DISPLAY"
900 ENDPROC
```

Basicode and the Spectrum

Ian Logan explains how to produce a Basicode listing

In last week's article I discussed how it is possible to use a Spectrum to examine the signals found on a cassette tape containing for example, a BBC *Basicode* program. In this week's article, I give a Spectrum program that *Loads* a *Basicode* tape and produces a print-out of the program.

Before using the *Basicode Listing* program, it is necessary to obtain a fairly 'clean' *Basicode* recording — I can only suggest that you try recording from a VHF transmission onto an unsophisticated 'mono' cassette recorder. Last week's *Tape Examiner* program can be used to assess the quality of the recording. Traces as good as those featured last week are desirable and signify a sufficiently high standard of recording.

The accompanying *Basicode Listing* program contains a fairly complex machine code routine that reads a *Basicode* tape and stores the program it finds in 'free' Ram, from location 36864 onwards. There is provision for up to 12K of program to be *Loaded*.

The routine in lines 400–480, at present leads to the *Basicode* program appearing on the tv screen, but this can be altered as required. For example, to save the program on Microdrive one might add

```
405 OPEN #2 "m" 1 "program 1"
460 IF B=3 THEN CLOSE #2 STOP
```

Or, to use a ZX Printer, change line 460 to read

```
460 LPRINT CHR$ b
```

Once a listing of a *Basicode* program has been obtained, it then has to be 'translated' into Sinclair Basic which is not a straightforward task. There are several problems to consider. 1 There are several subroutines that are common to all *Basicode* programs and these are not transmitted with the programs, eg the subroutine at line 210 is an *Input* routine that returns a value *In$*. A suitable Spectrum subroutine might be

```
210 LET IN$=INKEY$. IF IN$="" THEN GOTO
    210
211 RETURN
```

2 *Basicode* programs normally require a screen of size 40 characters by 24 characters, which is not very easy to produce on the Spectrum using machine code, let alone in Basic. 3 *Basicode* uses typical Microsoft Basic string slicing, ie, it uses *Left$* and *Mid$*, and these can be very difficult to translate if the programmer has not given a lot of Rem statements.

Overall translation is far from easy and I await with interest the Basicode Spectrum kit that is to become available shortly.

A note about the machine code routine — This routine in Z80 machine code language makes use of monitor subroutines that 'wait' for one (05e7h) or two (05e3h) transitions in the signal arriving at the Spectrum's cassette port. The details of these routines are given in *The Complete Spectrum Rom Disassembly* by myself and Dr Frank O'Hara.

```
 10 REM  ** BASICODE LISTER **
 20
 30 REM  ** bv Dr.Ian Loqan **
 40
100 REM load machine code
110 RESTORE
120 FDR a=32768 TD 32913
130 READ n
140 POKE a.n
150 NEXT a
160
200 REM load oroqram
210 CLS
220 PRINT AT 3.7:"BASICODE LISTER"
230 PRINT AT 5,3:"written bv
    Dr.Ian Loqan"
240 PRINT AT 10.0:"Position your
    BASICODE tape."
250 PRINT AT 12,0:"Connect vour
    lead for LOADING"
260 PRINT AT 14.0:"in the normal
    manner."
270 PRINT AT 16.0:"Press PLAY and
    any key."
280 PAUSE 0
290 CLS
300 PRINT AT 6.11:"LOADING"
320 RANDOMIZE USR 32768
330
400 REM display proqram
410 CLS
420 FDR a=36864 TO 49151
430 LET b=PEEK a
440 IF b=2 THEN GD TD 470
450 IF b=3 THEN STOP
460 PRINT CHR$ b:
470 NEXT a
480
1000 REM machine code data
1010 DATA 221.33.0.144.17.0.48
1020 DATA 243.62,15.211.254.219
1030 DATA 254,31.230.32,246.2
1040 DATA 79,191.32.120.6,0,205
1050 DATA 231,5.48,247.33.21.4
1060 DATA 16.254.43.124.181.32
1070 DATA 249.205.227.5.48.232.6
1080 DATA 176.205.227.5,48.225
1090 DATA 62.180.184,48.224.62
1100 DATA 200.184.56.219.36.32
1110 DATA 236.6.176.205.231.5.48
1120 DATA 205.62.190.184.48.244
1130 DATA 6,176.205.231,5.48.193
1140 DATA 121.230,252.203.87.32
1150 DATA 2.246.3.79.38,7.46.0
1160 DATA 6.176.205.227.5,62.198
1170 DATA 184,245.6.176,212.227
1180 DATA 5.241,63.203,29,37.32
1190 DATA 235.203.61.221.117.0
1200 DATA 221.35.62,3.189.40,12
1210 DATA 62.127,219.254.31.48.5
1220 DATA 122.179,27.32.178
1230 DATA 195.63.5
```

```
;tape reader for BASICODE
;written by  Dr. Ian Logan

        org  8000h  ;32768 dec.

;initialize
start   ld   ix,9000h  ;dest
        ld   de,3000h  ;length
        di   ;interrupts off
        ld   a,04h
        out  (0feh),a ;clear port
        in   a,(0feh) ;
        rra
        and  20h
        or   02h       ;red border
        ld   c,a
        cp   a

;start to look for pulses
ld br   jr   nz,end
        ld   b,00h
ld st   call 05e7h     ;listen
        jr   nc,ld br
        ld   hl,0415h ;wait now
ld wa   djnz $
        dec  hl
        ld   a,h
        or   l
        jr   nz,ld wa
        call 05e3h   ;check still
        jr   nc,ld br ;pulsing

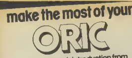
;confirm on leader
ld le   ld   b,0c0h
        call 05e3h
        jr   nc,ld br
        ld   a,0b4h ;too short?
        cp   b
        jr   nc,ld st
        ld   a,0d0h ;too long?
        cp   b
        jr   c,ld st
        inc  h
        jr   nz,ld le

;now find each byte
ld sy   ld   b,0c0h
        call 05e7h
        jr   nc,ld br
        ld   a,0beh
        cp   b
        jr   nc,ld sy ;until sync
        ld   b,0c0h
        call 05e7h    ;discard
        jr   nc,ld br
        ld   a,c
        and  0fch ;change colours
        bit  2,a
        jr   nz,ld cl
        or   03h
ld cl   ld   c,a

;get the bits of the byte
ld 7    ld   h,07h ;7 bits/byte
        ld   l,00h ;collect in l
loop    ld   b,0b0h
        call 05e3h
        ld   a,0c6h
        cp   b      ;0 v. 1
        push af
        ld   b,0b0h
        call nc,05e3h ;discard
        pop  af
        ccf  ;complement
        rr   l         ;save it
        dec  h
        jr   nz,loop  ;all byte?

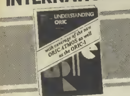
;now store byte
        srl  l  ;final shift
        ld   (ix+0),l ;store it
        inc  ix        ;step on

;look for end
        ld   a,03h
        cp   l
        jr   z,end
        ld   a,7fh
        in   a,(0feh)
        rra
        jr   nc,end    ;read break
        ld   a,d
        or   e
        dec  de
        jr   nz,ld sy ;all done?
end     jp   053fh    ;exit
```



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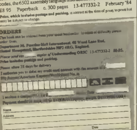


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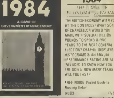
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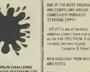
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Microdrive catalogue

John Santi demonstrates the use of the Cat command for e catalogue listing of all files on Microdrive

The *Cat* command in Sinclair Basic will list on the screen the names of the first 50 files stored on a microdrive cartridge However if a file has been saved with the 1st character of the filename set to *Chr$ 0* this filename is ignored by the *Cat* command and not listed

Having used this technique to save files and, at a later stage, being unable to load the files because of the names being forgotten I devised a method to allow a catalogue listing of all files on a cartridge

The *Cat* routine resides between locations 7256 and 7479 decimal (*1C58h* to *1D37h*) in the 8K shadow Rom By copying the contents of the Rom to Ram memory, the code can be disassembled On examining the code it can be seen that with the exception of one instruction, a direct *Jump*, the routine is relocatable — that is, it can be run from any location in memory

After modifying this single instruction to point to its correct new address the routine was run from its new location and displayed a normal *Cat* list on the screen Since the routine can run from Ram memory, it can be modified to operate in a different way

The instructions at address 7301 decimal (*1C85h*), see Fig **1**, test the 1st character of the filename for *Chr$ 0* and whether that value jumps to a point beyond the instructions which display the file name By replacing the jump instruction with *Nops*, this modified *Cat* routine will display all the names of the files on the cartridge

The following procedure will create a program which, when run, will produce a full *Cat* of a cartridge

Step 1 — Enter and run the following command

SAVE * "m" 1 "newrom" CODE 0,8192

This creates a *Code* file on microdrive 1 containing the 8K of machine code in the shadow Rom as, while the *Save* * is being executed, the shadow 8K Rom is paged in.

Step 2 — Enter the program in Figure 2 with the cartridge containing "newrom" placed in drive 1 This program modifies the *Cat* routine and adds on the instructions to enable the routine to be used from Basic

Step 3 — Enter the program in Figure 3 and save on the cartridge which contains "modrom" by using the instruction

SAVE * "m" 1, "fullcat"

To obtain a full catalogue of a cartridge, load the program "fullcat", insert the cartridge to be catalogued in drive 1 and Run the program The screen display will show all the files Those saved with *Chr$ 0* will have a *?* in the 1st character position of the name Figure 4 shows a listing of the cartridge supplied with each microdrive on which I saved "example" with *Chr$ 0* in the 1st position

For anyone who has access to an RS232 printer the listing can be redirected to the printer by using the program in Figure 5 instead of the program in Figure 3

The routine added in Step 2 to the 8K Rom sets up the stream number for the *Cat* output (2 for screen, 3 for ZX printer) pages in the 8K Rom calls the new *Cat* routine, restores the system variables and then returns to Basic Figure 6 shows an assembler listing of the routine

Since most of the routines in the 8K Rom appear to be relocatable, it may be possible to modify other commands using this technique

fig 1. ROM Routine

```
    LD     A,(IX+47)     ; get 1st character of name
    OR     A             ; test for all 0's
    JR     Z,address     ; if 0's then skip displayroutine
```

fig 2. Modifier program.

```
 10 LOAD *"m";1;"newrom"CODE 32768
 20 POKE 40073,0: POKE 40074,0: POKE 40179,156
 30 FOR x=40960 TO 40980
 40 READ s
 50 POKE x,s
 60 NEXT x
 70 SAVE *"m";1;"modrom"CODE 32768,8213
 80 DATA 62,2,50,216,92,33,88,156
 90 DATA 34,237,92,217,229,217,207,50
100 DATA 217,225,217,251,201
```

fig 3. FULLCAT listing

```
 10 CLS
 20 LOAD *"m";1;"modrom"CODE
 30 RANDOMISE USR 40960
```

fig 4. Full CAT list.

```
Demo

????????
?example
?m will ma
Database
Dbase prog
P server
net game
run
title ( SCREEN$ )

66
```

RS

```
 5 REM change baud rate to suit printer
10 FORMAT "t";1200
20 OPEN #3;"t"
30 LOAD *"m";1;"modrom"CODE
40 POKE 40961,3
50 RANDOMIZE USR 40960
```

fig 6. Assembler listing of calling routine

```
LD      A,02         ; stream no.
LD      (5CD8),A     : into system variable
LD      HL,9C58      : newcet address
LD      (5CED),HL    : into system variable
EXX                  : save H'L'
PUSH    HL           : registers
EX                   : on stack
RST     08           : page in shadow rom
DEFB    32           : and call 9C58
EXX                  : restore
POP     HL           : H'L'
EXX                  : registers
EI                   : restore interrupts
RET                  : return to BASIC
```

Booting a disc

***Brian Cadge** looks at the I/O functions of the disc drive from machine language*

This article looks at the I/O functions of the Dragon disc drive from machine language in particular the *Boot* command

If you've read the Dragon Dos manual very closely, you may have noticed that the *Boot* command exists to "load in another operating system" No other information is given, certainly not how to use the command. what it really does or how to produce a disc that can be *Booted* If you try typing *Boot* with a normal disc inserted, you'll get a *BT Error* (Boot error)

In fact the *Boot* command is a useful machine code loading command Providing the disc in the drive is an OS disc (see later) typing *Boot* loads 4K of code in memory starting at address *9728* and then automatically executes it from address *9730* As this can be any machine language program it can relocate itself at the top of Ram or load more code, although 4K is usually enough for a fair program

The machine language program listed in assembly (and in the form of a Basic loader program for users without assemblers) will produce an example OS disc for you The program that will be *Booted* only serves as an example and is not intended to be particularly useful the important point is how a boot disc is prepared

When you type the command *Boot*, the Dos reads sector 3 of track 0 — the first two bytes of this sector must be the Ascii codes for OS otherwise a *?BT Error* is generated Provided it finds the OS flag the following 4K of code is loaded from this position on the disc and is executed

So to produce an OS disc all that is needed is to write the code starting at address *9728* with 'OS and save it to disc starting at track 0, sector 3 The normal *Save* command cannot be used as we have no control over where the code goes on the disc (this is handled by the Dos directory) A possible way is to use *Swrite*, but this involves a lot of tedious mucking about with strings, etc The best method is to use the Rom routines that control the I/O of sectors on the disc drive

As an OS disc should not contain any Basic my program formats the disc before writing to it (hence any information previously on it will be lost) this is achieved by the Rom routine at 50108

To save a sector of data (256 bytes) to disc, location 235 is set up to the drive number (Default=1) — location 236 is the track and 237 the sector Locations 238/239 point to the beginning of the data to be stored The write routine starts at 49409 Referring to the assembly language program it saves a sector at a time until the end of track one — this is not quite 4K, but is plenty for this short program The program comments should help clarify what's going on When it's finished, it returns to Basic.

The read routine is set up as the write routine, except location 238/239 points to the Ram where the data will be transfered to The read routine starts at address 49412

Although it is not used here the zero flag is set if any error occurs (eg disc not ready) when using the read/write routines

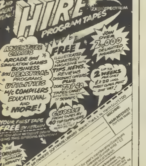
To use the program type in and run the Basic listing, taking care with the data statements Then put a fresh disc in the drive and press any key When the disc is completed OK will appear Having saved the Basic program to a different disc, turn the Dragon off and on, insert the OS disc and type *Boot*, the example program should then start itself up Press *Break* to return to Basic

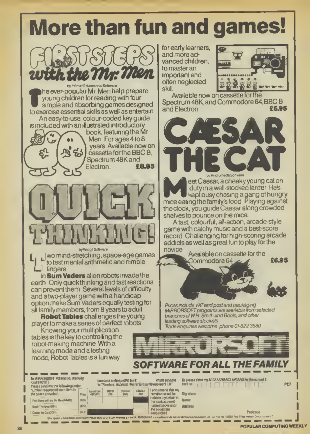
This machine code routine can be used to produce your own OS discs For example I used it to produce a disc that, when *Booted* sets up an inverse video text print routine (similar to that published last year in *PCW*) The important part of the program is that which starts at *@start* — this is relocatable, so your OS program which goes before this can be any length

```
4E21                  *
4E21                  * PRODUCE AN EXAMPLE BOOT DISK
4E21                  *
2600  2600                  ORG   9728
2600 4F53             START FCC   /OS/        BOOT FLAG
2602                  *
2602                  * THE PROGRAM HERE WILL EXECUTE
2602                  * WHENEVER THE DISK IS 'BOOTED'
2602                  *
2602 BD0A77                 JSR   47735       DO A CLS
2605 8E262F                 LDX   #TEXT-1     MESSAGE
2608 0F6F                   CLR   111         CHANNEL 0
260A BD90E5                 JSR   37093       PRINT IT
260D BDB8E5           INKEY JSR   48101       SCAN KEYS
2610 8103                   CMPA  #3          BREAK?
2612 2716                   BEQ   END
2614 8153                   CMPA  #'S         S KEY?
2616 2706                   BEQ   MOTON
2618 8145                   CMPA  #'E         E KEY?
261A 2709                   BEQ   MOTOFF
261C 20EF                   BRA   INKEY       NO KEY
261E 8604             MOTON LDA   #4
2620 B7FF40                 STA   $FF40
2623 20E8                   BRA   INKEY
2625 7FFF40           MOTOFF CLR  $FF40
2628 20E3                   BRA   INKEY
262A 7FFF40           END   CLR   $FF40       MOTOR OFF
262D 7E8371                 JMP   33649       GOTO BASIC
22630 5448495320 TEXT   FCC /THIS IS A BOOT DISK/
2643 0050524553   FCC 13,/PRESS S TO START AND/
2658 4520544F20   FCC /E TO STOP/,13,/MOTOR - /
266A 6272656160   FCC /break FOR BASIC./,0
2679                  *
2679                  * THIS PART OF THE PROGRAM SAVES
2679                  * THE ABOVE BOOT PROGRAM TO DISK
```

```
2678                  * DISK WILL BE FORMATTED FIRST!
2678                  *
2678 4F               @START CLRA
267C BDC30C                  JSR    50188     DSKINIT
267F 0FEC                    CLR    236       TRACK 0
2681 8603                    LDA    #3
2683 97ED                    STA    237       SECTOR 0
2685 8E2680                  LDX    #9728     START ADRS
2688 3410             SAVE   PSHS   X
268A 9FEE                    STX    238       BUFFER ADR
268C BDC101                  JSR    49409     WRITE DISK
268F 3510                    PULS   X
2691 30890100                LEAX   256,X
2695 0CED                    INC    237
2697 96ED                    LDA    237
2699 8113                    CMPA   #19
269B 25EB                    BLO    SAVE
269D 7E0371                  JMP 33649        GOTO BASIC
26A0

10 PCLEAR1
20 FORI=0 TO 159:READA$:POKE 9728+I,VAL("&H"+A$):NEXTI
30 PRINT"PRESS ANY KEY TO FORMAT/WRITE   TO BOOT DISK"
40 EXEC 41194
50 EXEC &H2678
60 END
100 DATA 4F,53,00,0A,77,8E,26,2F,0F,5F,8D,90,E5,0D,88,E5,01,03,27,15
110 DATA 81,53,27,05,81,45,27,09,20,EF,06,04,07,FF,40,20,E0,7F,FF,40
120 DATA 20,E3,7F,FF,40,7E,83,71,54,49,49,53,20,49,53,20,41,20,42,4F
130 DATA 4F,54,20,44,49,53,4B,0D,50,52,45,53,53,20,53,20,54,4F,20,53
140 DATA 54,41,52,54,20,41,4E,44,45,20,54,4F,20,53,54,4F,50,0D,4D,4F
150 DATA 54,4F,52,20,2D,20,62,72,65,61,6B,20,46,4F,52,20,42,41,53,49
160 DATA 43,2E,00,4F,8D,C3,8C,BF,EC,06,83,97,ED,8E,26,00,34,10,9F,EE
170 DATA 8D,C1,01,35,10,30,89,01,00,0C,ED,96,ED,81,13,25,E8,7E,83,71
```




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Commodore 64

Automatic loader

R Brown presents a loader program that does away with the need for several key presses

This short machine code program will allow you to automatically load a machine code program without the need for several keypresses.

I have provided extensive notes on the actual code in the hope that this will provide a simple introduction to the subject of machine code.

Similar loaders are often used in professional programs where there are several files of code. For your reference the figures in the third column of the disassembly represent the hexadecimal equivalents of the decimal numbers in the Data statements in the program.

```
100 REM ********************************
105 REM *                              *
110 REM *     BASIC LOADER FOR         *
115 REM *                              *
120 REM *   A U T O  R U N  C8M 64     *
125 REM *                              *
130 REM *   PROGRAM BY  R W BROWN.     *
135 REM *                              *
140 REM *        JANUARY 1984          *
145 REM *                              *
150 REM ********************************
1000 FORZ=49152TO49292
1010  READ A
1020  POKEZ,A
1030  B=B+A
1040 NEXT Z
1050 IF B<>16468 THENPRINT"?{CUR DN} ERROR TOTAL WAS ';B:STOP
1060 PRINT" CORRECT USE  SYS49152  TO USE':END
1100 DATA162, 0, 189, 79, 192, 157, 167, 2, 232, 224, 80
1110 DATA208,245, 173, 2, 3, 141, 141, 192, 173, 3
1120 DATA 3, 141, 142, 192, 169, 2, 160, 167, 141, 3
1130 DATA 3, 140, 2, 3, 169, 0, 162, 1, 160, 1
1140 DATA 32, 186, 255, 169, 0, 32, 189, 255, 169, 167
1150 DATA 133, 43, 169, 2, 133, 44, 162, 10, 160, 3
1160 DATA 169, 43, 32, 216, 255, 173, 141, 192, 141, 2
1170 DATA 3, 173, 142, 192, 141, 3, 3, 96, 169, 1
1180 DATA 141, 32, 208, 169, 225, 141, 40, 3, 162, 0
1190 DATA 189, 220, 2, 157, 0, 128, 232, 224, 10, 208
1200 DATA 245, 169, 1, 162, 1, 160, 1, 32, 186, 255
2100 DATA 169, 0, 32, 189, 255, 169, 0, 162, 255, 160
2110 DATA 255, 32, 213, 255, 134, 45, 132, 46, 76, 0
2120 DATA 192, 167, 3, 0, 0, 195, 194, 205, 56, 48
2130 END
READY.
```

```
5 0000    ' TO USE THIS AUTO RUN PROGRAM TYPE
10 0000   ' IN THE BASIC LOADER  AND THEN SAVE IT
15 0000   '          YES SAVE IT FIRST
20 0000   ' NOW RUN IT. IF ALL IS WELL  CORRECT
25 0000   ' WILL BE PRINTED ON THE SCREEN,
30 0000   ' NOW POSITION A BLANK TAPE INTO
35 0000   ' YOUR RECORDER AND TYPE
40 0000   ' SYS49152 (RETURN)
45 0000   ' PRESS PLAY AND RECORD AS REQUESTED
50 0000   ' WHEN THE SCREEN RETURNS STOP THE TAPE
55 0000   ' BUT DO NOT REWIND IT  YOU NOW HAVE A
60 0000   ' SHORT LOADER WHICH WILL LOAD THE NEXT
65 0000   ' PROGRAM ON THE TAPE  IF YOU POSITION
70 0000   ' YOUR MACHINE CODE PROGRAM AT $C000
75 0000   ' OR 49152 THE IT WILL BE CALLED AFTER
80 0000   ' THE LOAD HAS FINISHED. YOU WILL ALSO
85 0000   ' FIND THE RUN/STOP RESTORE IS DISABLED
90 0000   ' AND USEING A RESET SWITCH LOADS THE
95 0000   ' NEXT PROGRAM
96 0000
97 0000   '
98 0000
99 0000   '
100 0000    ********************************
105 0000    *                              *
110 0000  ' *     A U T O  L O A D E R     *
115 0000    *                              *
120 0000  ' *         WRITTEN BY           *
125 0000    *                              *
130 0000  ' *          R  W  BROWN         *
135 0000    *                              *
140 0000  ' * TO USE   AFTER ASSEMBLY AT   *
145 0000    * 49152 ($C000) THEN SYS49152. *
150 0000  ' * THIS WILL THEN SAVE A LOADER *
155 0000  ' * TO TAPE   THIS  LOADER  WILL *
160 0000    * AUTO START AND LOAD THE NEXT *
165 0000  ' * PROGRAM ON  THE  TAPE  WHICH *
167 0000  ' * SHOULD START AT $C000        *
165 0000  ' *                              *
170 0000  ' *   (C) COPYRIGHT  R W BROWN   *
185 0000    *                              *
186 0000    *        JANUARY  1984         *
187 0000    *                              *
195 0000    ********************************
500 0000
510 0000
520 0000     START ADDRESS
530 0000     AT 49152 DECIMAL
535 0000
537 0000
540 C000   *=$C000
550 C000   '
560 C000
570 C000
580 C000
1000 C000    START BY MOVING LOADER TO $02A7
1001 C000  ' THIS IS WHERE THE PROG WILL GO
1002 C000    WHEN LOADED IN AGAIN.
```

Commodore 64

```
1003 C000
1004 C000
1005 C000                 [illegible] POSITION
1006 C000
1007 C000
5000 C000 A200                   LDX #$00
5010 C002 BD4FC0 [illegible]     LDA DATA,X
5020 C005 9DA702                 STA $02A7,X
5030 C008 E8                     INX
5040 C009 E05B                   CPX #$5B
5050 C00B D0F5                   BNE RELOCATE
5051 C00D
5052 C00D
5053 C00D            SET AND STORE OLD  WARM START
5054 C00D            POINTER UNTIL END OFF LOAD
5055 C00D
5056 C00D
5060 C00D AD0203                 LDA $0302
5070 C010 8D0DC0                 STA FINISH
5080 C013 AD0303                 LDA $0303
5090 C016 8D0EC0                 STA FINISH+1
5091 C019
5092 C019
5093 C019            SET UP AND STORE NEW  WARM START
5094 C019            POINTERS IN $0302 & $0303
5095 C019
5096 C019
5100 C019 A902   RELO            LDA #$02
5110 C01B A0A7                   LDY #$A7
5120 C01D 8D0303                 STA $0303
5130 C020 8C0203                 STY $0302
5131 C02[illegible]
5132 C02[illegible]
5133 C02[illegible]        SET UP AND CALL KERNAL ROUTINE
5134 C02[illegible]        TO INITIAISE SECONDARY ADDRESS
5135 C02[illegible]        IE      SAVE   .1.1
5136 C02[illegible]        SO THAT THE PROGRAM WILL NOT
5137 C02[illegible]        RELOCATE WHEN LOADED BACK IN
5138 C02[illegible]
5139 C023
5140 C023 A900   SAVER           LDA #$00
5150 C025 A201                   LDX #$01
5160 C027 A001                   LDY #$01
5170 C029 20BAFF                 JSR $FFBA
5171 C02C
5172 C02C
5173 C02C            CALL KERNAL ROUTINE TO SET
5174 C02C            UP A NAME  THE LOADER WILL
5175 C02C            HAVE NO NAME
5176 C02C
5177 C02C
5180 C02C A900                   LDA #$00
5190 C02E 20BDFF                 JSR $FFBD
5191 C031
5192 C031
5193 C031            SET UP AND CALL KERNAL ROUTINE
5194 C031            TO SAVE   ,1,1 FROM $02A7-$030A
5195 C031
5196 C031
5200 C031 A9A7                   LDA #$A7
5210 C033 A002                   LDY #$02
5220 C035 852B                   STA $2B
5230 C037 842C                   STY $2C
5240 C039 A20A                   LDX #$0A
5250 C03B A003                   LDY #$03
5260 C03D A92B                   LDA #$2B
5270 C03F 20D8FF                 JSR $FFD8
5271 C042
5272 C042
5273 C042            TIDY UP REPOINT WARM START
5274 C042            TO ITS ORIGNAL LOCATION
5275 C042
5276 C042
5280 C042 AD0DC0                 LDA FINISH
5290 C045 8D0203                 STA $0302
5300 C048 AD0EC0                 LDA FINISH+1
5310 C04B 8D0303                 STA $0303
5311 C04E
5312 C04E          '
5313 C04E          ' RETURN TO BASIC STOP THE TAPE
5314 C04E          ' TURN OFF THE CBM 64 AND THEN
5315 C04E          ' LOAD AND SAVE YOUR PROGRAM
5316 C04E          '
5317 C04E          '
5320 C04E 60                     RTS
5330 C04F          '
5340 C04F          '
5350 C04F          ' -------------------------------
5351 C04F          '
5352 C04F          ---------------------
5353 C04F          '
5354 C04F
5355 C04F          '
5356 C04F          ' START OF AUTO LOADER
5357 C04F          ' CHANGE BORDER COLOUR WHITE
5358 C04F
5359 C04F
5360 C04F A901   DATA            LDA #$01
5370 C051 8D20D0                 STA $D020
5371 C054
5372 C054
5373 C054            DISABLE RUN/STOP AND RESTORE
5374 C054
5375 C054
5380 C054 A9E1                   LDA #225
5390 C056 8D2803                 STA $0328
5391 C059          '
5392 C059          '
5393 C059          ' SET UP AUTO START AGAINST
5394 C059          ' THOSE NASTY PEOPLE WITH
5395 C059          ' RESET SWITCHES
5396 C059          ' START AT $8000
5397 C059          '
5399 C059
5400 C059 A200                   LDX #$00
5410 C05B BDDC02 AUTOCBM         LDA $02DC,X
5420 C05E 9D0080                 STA $8000,X
5430 C061 E8                     INX
5440 C062 E00A                   CPX #$0A
5450 C064 D0F5                   BNE AUTOCBM
5451 C066
5452 C066          '
5453 C066          ' SET UP AND CALL KERNAL ROUTINE
5454 C066          ' TO INITIAISE SECONDARY ADDRESS
5455 C066          ' IE.       LOAD"",1,1
5456 C066          ' SO THAT THE PROGRAM WILL NOT
5457 C066          ' RELOCATE WHEN LOADED BACK IN
5458 C066          '
5459 C066          '
5460 C066 A901                   LDA #$01
5470 C068 A201                   LDX #$01
5480 C06A A001                   LDY #$01
5490 C06C 20BAFF                 JSR $FFBA
5491 C06F          '
5492 C06F
5493 C06F            CALL KERNAL ROUTINE TO SET
5494 C06F          ' UP A NAME  THE LOADER WILL
5495 C06F          ' LOAD IN FIST PROGRAM.
5496 C06F
5497 C06F
5500 C06F A900                   LDA #$00
5510 C071 20BDFF                 JSR $FFBD
5511 C074
5512 C074          '
5513 C074          ' CALL KERNAL ROUTINE TO
5514 C074            LOAD PROGRAM
5516 C074
5517 C074
5520 C074 A900                   LDA #$00
5530 C076 A2FF                   LDX #$FF
5540 C078 A0FF                   LDY #$FF
5550 C07A 20D5FF                 JSR $FFD5
5560 C07D 862D                   STX $2D
5570 C07F 842E                   STY $2E
5571 C081          '
5572 C081
5573 C081          ' CALL NEW PROGRAM AT
5574 C081            $C000 AND RUN IT
5576 C081
5577 C081
5580 C081 4C00C0                 JMP $C000     ' CALL PROG
5581 C084
5582 C084
5583 C084            DATA FOR WARM START
5584 C084            COLD START  CBM  WITH
5586 C084            BIT 7 SET AND  64  IN
5587 C084            ASSCI FORM.
5588 C084
5589 C084
5590 C084 A70300 DATA2          BYT $A7,$03,$00,$00
5600 C088 C3C2CD                BYT  C+128, B+128, M+128
5610 C08B 3634                  TXT "64"
5621 C08D
5622 C08D          '
5625 C08D            TABLE TO STORE POINTERS
5626 C08D          '
5627 C08D          '
5630 C08D EA     FINISH          NOP
```



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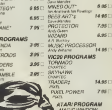
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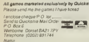
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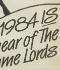
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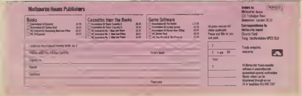


COMMODORE

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Open Forum

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the _Program of the Week_ double our new fee of £8 for each program published.

Security

on Dragon

The purpose of the program is to convert a message or date into a coded form which can then be decoded by the recipient. Despite using a very simple system, the coding is really quite secure.

It works like this: a keyword is chosen which may be any alphanumeric string not using the letters F, P or Z. A new string is formed by concatenating the ASCII values of the letters.

The message is then examined, one letter at a time. The ASCII of the first letter is multiplied by the first digit of the coding string (by 'VAL'), and the product gives the first three-digit group in the coded message.

Each three-digit number in the coded version thus represents one character in the original message.

The ASCII of the second letter of the message is then multiplied by the second digit in the coding string and so on. When all the digits have been used it starts again from the beginning.

Most of the program is concerned with input and output. The 'Guts' are lines 200-240 (keyword), 300-330 (encoding) and 380-400 (decoding). The code phrase could be something like 'Your middle name' or 'Your car license number' or it could be omitted and an agreed keyword used instead. The example below the listing is the coded version of a Robert Frost poem. The listing was produced on a Seikosha GP-100A. For £ read hash sign.

```
1 '************* CRYPTO ****************
2 '*** ENCRYPTION/DECRYPTION PROGRAM ***
3 '********** FOR THE DRAGON 32 *********
4 '******** <C> 1984 IAN BENNETT ********
5 '****** UNICORN COMPUTER SERVICES *****
10 CLEAR10000 CLS
20 PRINT'MODE:-
30 PRINT'          ENCODE  1"
40 PRINT           DECODE  2"
50 INPUT'                ";E
60 PRINT'INPUT CHANNEL -'
70 PRINT"        TERMINAL  0'
80 PRINT         TAPE      1
90 INPUT'                ':IC
100 PRINT PRINT OUTPUT CHANNEL -"
110 PRINT"        TERMINAL  0
120 PRINT'        TAPE      1'
130 PRINT"        PRINTER   2"
140 INPUT"                 ";OC
150 IFE=1ANDIC=1THENPRINT'  DATA FOR ENCODING CANNOT BE          ACCEPTED FROM TA
PE  PRINT                HIT ANY KEY' £/EC41194 RUN
160 IFIC=1THENPRINT'   SET TAPE TO 'PLAY  THEN HIT             ANY KEY" EXEC41194
170 IFOC=1THENPRINT   SET TAPE TO  RECORD' THEN HIT             ANY KEY" EXEC41194
180 OPEN"O  £-OC,""
190 OPEN"I' £-IC,""
200 IFIC=1THENINPUT£-1 C$ CLS:PRINT"CODE PHRASE IS -   PRINTC$
210 PRINT ENTER KEYWORD (NO 'F', P' OR  Z')  INPUTK$
220 FORL=1TOLEN K$ :
230 A$=A$+RIGHT$ STR$ ASC(MID$(K$ L 1))) 2)
240 NEXT
250 ON E GOTO250 340
260 OPEN O  £-CH  "
270 LINEINPUT'ENTER A CODE PHRASE FOR KEYWORD " C$ PRINT£-OC 'CODE PHRASE IS  +C
$
280 K=1 CLS
290 LINEINPUT"MESSAGE ( ZZZ  TO END   /^  FOR LINE FEED)' M$ IFM$='ZZZ"THENPRIN
T£-OC CLOSE£-OC ENDELSEIFM$= ' ?"THENM$=CHR$(13)
300 M=1
310 PRINT£-OC,ASC(MID$(M$ M 1)*VAL(MID$(A$ K,1))
320 M=M+1 K=K+1 IFK>LEN A$ THENK=1
330 IFM=<LEN(M$)THEN310ELSE290
340 K=1 CLS
350 IFIC=0THENPRINT"NUMBER GROUP (9999 TO END)"
360 IFIC=0THEN380
370 IF EOF(-1) THENPRINT£-OC CLOSE£-1 END
380 IFIC=1THENINPUT£-1,D ELSEINPUTD IFD=9999THENEND
390 PRINT£-OC CHR$ D VAL MID$(A$,K,1)))
400 K=K+1 IFK>LEN A$ THENK=1
410 GOTO360

CODE PHRASE IS MAKER OF GP-100A PRINTER
 672  312  606  200  833  333  777  500  805  208  776  42  707  64  648  555
944  303  648  1089  300  300  679  570  749  288  776  330  780  64  690  505
900  336  264  117  462  351  612  160  511  208  892  291  826  202  192  560
912  333  654  945  805  303  905  168  812  999  256  321  707  202  672  220
104  195  660  900  124  327  735  540  707  1035  256  348  777  64  618  555
256  294  606  918  777  342  707  160  511  288  920  324  707  202  672  230
976 560 752.
```

Security
by Ian Bennett

Open Forum

Hall of Fame

on Vic 20

This is not a program in its own right, but a routine to include at the end of your own programs to give the Top Ten best scores. In the listing Line 10 is used solely for you to input scores to test that the program is running correctly. Line 20 would be a decision taken at the end of your program as to whether the score obtained, Y was high enough and if not line 30 would just show the current state of the Top Ten. Line 9570 would need to be changed to redirect you back to the start of the game.

Program notes

Line	
10	Simulates a score being attained.
20	Is the score in the Top Ten?
30	Score not in Top Ten. Just show the current position

Having input your score the program waits for you to press three keys (simulating input of initials)

9000-9060	Takes each key in turn and prints it on the screen waiting for each key to be pressed. It then adds them together to make M$
9070-9080	Determines your ranking in the top 10
9100-9120	Moves the scores and corresponding initials down to make room for your score
9130	Puts your score and initials in the correct position
9500-9550	Prints the top ten scores
9560	Holds the screen showing the Hall of Fame
9570	Line to redirect back to start of program

```
10 PRINT"■WHAT WAS YOUR SCORE", INPUTY
20 IFY>SC(10)THEN9000
30 GOTO9500
9000 GETA$ IFA$=""THEN9000
9010 PRINTA$
9020 GETB$ IFB$=""THEN9020
9030 PRINT"■",B$
9040 GETC$ IFC$=""THEN9040
9050 PRINT"■" C$
9060 M$=A$+B$+C$
9070 FORL=1TO10
9080 IFY>SC(L)THENP=L L=10
9090 NEXT
9100 FORR=10TOP+1STEP-1
9110 SC(R)=SC(R-1) SC$(R)=SC$(R-1)
9120 NEXT
9130 SC(P)=Y SC$(P)=M$
9500 PRINT"■■■■HALL OF FAME" PRINT
9530 FORL=1TO.0
9540 PRINTL PRINT"■■",SC(L),SC$(L)
9550 NEXT
9560 GETQ$ IFQ$=""THEN9560
9578 GOTO10
```

Hall of Fame
by M Dixon

Space Walk

on Vic 20

This program is for the unexpanded machine. The program prints a random asteroid field. You are at the top of the asteroids. You have got to get to the bottom, where there is a little circle.

When you are at the bottom you have to jump on to the circle, and you have made it. Then it will play a melody and print up your moves and the least amount of moves. The computer will tell you whether you are a space cadel warrior or captain or supreme commender. If you do not make it, it will make the sound of a explosion and ask if you want another go.

Program notes

Lines	
10-40	Sets up screen & veriables
41-90	Instructions
97-140	Draws game
150-220	Movement
250-300	Works out if crashed or survived
560-578	Crash & sound for crash
580-590	Play again
600-640	Survived & sound for survived work out ranking
700-1040	Sound for begin
1100-1130	Title

Space Walk
by A Bissenden

Superman

on Spectrum

In this program for the ZX spectrum (16K) you play the part of Superman, flying above the landscape when you see a group of radioactive space mines If you manage to dodge them you score points, but the radiation damages your eyesight, this time you do not see the mines until they are much closer

If you beat the computer then there is a surprise waiting for you (Capital letters are entered in graphics mode) Use keys 6 & 7 to go up and down

Program notes

10-245	Graphics
250-330	Title page
348	Landscape
360-415	Variables
416-430	Main loop
510	Movement
560-580	Death
586-803	Steps up onto next level
1000-end	Suprise

```
  1 REM a
  2 LET score=0
 10 POKE USR "a"+0,BIN 0
 15 POKE USR "a"+1,BIN 0
 20 POKE USR "a"+2,BIN 01110000
 25 POKE USR "a"+3,BIN 01111000
 30 POKE USR "a"+4,BIN 01110000
 35 POKE USR "a"+5,BIN 11000000
 40 POKE USR "a"+6,BIN 11111110
 45 POKE USR "a"+7,BIN 11111111
 60 REM b
110 POKE USR "b"+0,BIN 0
115 POKE USR "b"+1,BIN 0
120 POKE USR "b"+2,BIN 11111100
125 POKE USR "b"+3,BIN 00111111
130 POKE USR "b"+4,BIN 00001111
135 POKE USR "b"+5,BIN 00000001
140 POKE USR "b"+6,BIN 01011111
145 POKE USR "b"+7,BIN 10111111
160 REM c
210 POKE USR "c"+0,BIN 00000000
220 POKE USR "c"+2,BIN 00000000
225 POKE USR "c"+3,BIN 00000000
230 POKE USR "c"+4,BIN 00011000
235 POKE USR "c"+5,BIN 00111100
240 POKE USR "c"+6,BIN 00111100
245 POKE USR "c"+7,BIN 00011000
250 REM program
260 INK 7  PAPER 0  BORDER 5. C
LS
265 PRINT AT 7,12;"BR"
270 PRINT AT 10,10,"SUPERMAN"
280 PRINT AT 10,10, OVER 1,"________"
290 PRINT AT 15,10,"© D.Taylor"
300 PRINT AT 16,10, 1983."
310 FOR a=1 TO 50  BEEP .1,a  N
EXT a
320 PRINT '''"Press a key to st
art."
330 IF INKEY$="" THEN GO TO 330
340 REM start game
345 CLS
346 PLOT 0,30  DRAW 255,0
360 LET a=11
365 LET w=10
368 PRINT AT a,w,"BR"
370 DIM z(30)
380 LET g=INT (RND*30)+1
390 FOR v=1 TO 30
400 LET z(v)=INT (RND*18)
410 NEXT v
415 LET h=30
416 FOR m=1 TO g
417 PRINT AT z(m),h+1," "
418 PLOT 0,30  DRAW 255,0
420 PRINT AT z(m),h,"C"
425 IF INKEY$<>"" THEN GO SUB 5
00
430 NEXT m
435 IF SCREEN$ (a,w+2)<>" " THE
N GO TO 550
440 LET h=h-1
441 IF h<4 THEN GO TO 600
450 GO TO 416
500 PRINT AT a,w,"  "
510 LET a=a+(INKEY$="6" AND a<2
0)-(INKEY$="7" AND a>1)
520 PRINT AT a,w,"BR"
530 RETURN
550 PRINT AT a,w,"=="
560 PRINT AT a,w, OVER 1,"BR"
570 PRINT AT a,w, OVER 1,"**"
575 PAUSE 1. PAUSE 80
580 PRINT AT a,w,"  "
585 PRINT ''''''"Score=",score
590 STOP
600 PRINT "WELL DONE!"  PRINT "
Now it gets harder!!!"
601 LET score=score+g· LET w=w+
4  CLS
602 IF w>30 THEN PRINT "You hav
e beat me!"  GO TO 1000
603 GO TO 360
1000 CLS   PRINT AT 10,10,"BR"
1005 PRINT ''''"You are good "SU
PERMAN!""
1007 PAUSE 100
1010 FOR a=0 TO 10  PRINT AT a,1
1,"C"
1020 PAUSE 10
1030 PRINT AT a;11," "
1040 NEXT a
1050 PRINT AT 10,10, OVER 1,"88"
1060 PRINT AT 10,10, OVER 1,"ee"
1070 PAUSE 200
1080 PRINT '''''''''"BUT NOT GOO
D ENOUGH!!"
1090 PRINT "Score=",score
1100 STOP
```

Superman
by David Taylor

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Pontoon

on Dragon

Pontoon is based on the card game. The computer has the bank and gives you a credit of 100 to start. If you get over 1000 the bank will be bankrupt. Aces can count as 1 or 11, five cards win. You can twist or stick, but not under 16. Cards are printed in text mode.

Program notes

80 100	Sets up cards
110 210	Title page
220 410	Prints up first two cards and rest of screen
420 430	Checks to see if cards are aces
560 670	Asks if extra cards required & prints it
680 910	Prints computers cards
920 990	Decides who has won
1000 1100	Subroutine which prints cards
1120 1230	Prints who has won & asks if another game is required

```
[illegible]
1090 NEXT B-1 GOTO1 0
440 PRINT@ [illegible] PLEASE ENTER HOW MUCH YOU
 WANT TO PL[illegible]
450 INP[illegible] F
160 PRINT@[illegible]
370 SOUN[illegible] 150 1
480 IFR>L THEN 450
490 Y A>5 IF Y>21 THENG$= O4CDEFGAB03CDE
FGAB01CDEFGAB[illegible] PLAY T80U25 +G$ PRINT@35

[illegible] PONTOON!![illegible] PRINT@384 FOR W 1 T[illegible]
 1400 NEX[illegible]
500 PRINT@35 [illegible] IF YOU WANT TO TWIST THEN
 PRESS T IF NOT PRESS N
510 D$ INKE[illegible]
520 IF[illegible] THEN 560
530 IF D$ [illegible]N AND [illegible]16 THEN PR[illegible]NT@3[illegible]
U CAN NOT [illegible]TICK PRINT@384 FOR W [illegible]
1400 NEXT W:GOTO500
540 IF D$ [illegible]N THEN 680
550 GOTO510
560 'EXTRA CARD
570 T RND(10 +
[illegible]
590 GOSUB[illegible]
600 [illegible]
[illegible] IF T [illegible] OR T [illegible] THEN PRINT@381 [illegible] HA
VE AN ACE [illegible] OR 11 G$ O3EFGDEAR[illegible] TE
FI[illegible] PLAY T100U25 +G$ INPUT[illegible]
[illegible]THEN PRINT@[illegible]
FOR [illegible]TO1000 NEXT[illegible]
[illegible] PRINT@384 [illegible] IF NOT PRE[illegible] N
640 PRINT@415,
[illegible]
650 [illegible] IF [illegible]THENG$ [illegible]
[illegible] O1AAGFEDC PLAY T[illegible]
NT@35 YOU HAVE GOT A FIVE CARD [illegible]
PRINT@384 FOR D 1 TO1400 NEXT[illegible]
00
660 IF T>21 THEN G$ O3GDD[illegible]
LAY T5U25 -G$ PRINT@35[illegible] YOU VE [illegible]
RINT@384, FOR W=1 TO 1400 NEXT W
  GOTO220
670 GOTO510
680 CLS3
690 G=0
700 FOR P-1 TO 10
710 SOUND P*5,1
720 NEXT P
730 PRINT@8, COMPUTERS TURN .
740 P=128
750 G=0
760 FOR N=1 TO 2
770 K=RND (10)+1
780 X=K
790 GOSUB950
800 G=G+K
810 IF K=11 AND G>=11 THEN K 1
820 IF K=11 AND G< 10 THEN K 11
830 NEXT N
840 IF [illegible]<16 AND [illegible]<21THEN U RND 10[illegible]
 GOSUB950 ELSE GOTO 870
850 IFU 11 AND G> 11THEN[illegible]
860 IF U=11 AND G< 10 THEN U 11
870 G G+U
880 IF G>21 THEN PRINT@2[illegible] HE BANK [illegible]
UST[illegible] FOR B [illegible] NEX [illegible]
220
890 IF G>1[illegible] AND [illegible]. THEN 920
900 F[illegible] NEXT N
910 G[illegible]
920 IF [illegible] AND [illegible]THEN PRINT@ [illegible]
[illegible]
930 [illegible]AND A=0 21 THENPRINT@3[illegible]
 WIN [illegible] PONT[illegible]
9[illegible] THENPRINT@3[illegible]
```

Open Forum

```
[illegible]
1040 IF [illegible] PRINT@P+32 [illegible]
[illegible]
1042 [illegible] PRINT@P M$; PRINT@P+32 [illegible]
[illegible]
10[illegible] IF [illegible] 6 THENPRINT@P,M$, PRINT@P [illegible]
[illegible] NT@P+64 M4$, PRINT@P+96 M3$ PRIN
[illegible] M1$, PRINT@P+ 60,M3$ PRINT@P+19
2,M[illegible]
1050 IF [illegible] THEN PRINT@P M$; PRINT@P[illegible]
M3$ PRINT@P+61 M2$, PR NT@P+96,M3$ PR
NT@P+128 M4$ PRINT@P+ 60,M3$ PR NT@P+
[illegible]
1100 PRINT [illegible]
1110 REM [illegible]
1120 CLS
1130 [illegible]
1140 [illegible]
1150 [illegible]
[illegible]
```

Pontoon

Microradio

GW6JJN

Dragon RTTY

Regular readers of Microradio will remember my description of the RTTY system for the Dragon 32 which was in use at the Swansea Microshow a few weeks ago. Many people have asked me to let you know more about this excellent program. Well, here goes.

This program is called the G4BMK RTTY for the Dragon and TRS80 colour computers and is available from M J Kerry, 22 Grosvenor Road, Seaford, East Sussex BN25 2BS. Michael, who wrote the machine code program, tells me that it can be used without an interface on the Dragon and TRS80. A tone unit, or modem, will improve performance of course, but it is still an achievement to receive and send radio teletype (RTTY) purely with a software approach.

Since I have already described my experiences with the program in Microradio (*PCW* Vol 3 No 5) I will not repeat myself, but will tell you what you get for your money. Your own call sign is programmed in by the author and can be changed if necessary. The program will automatically synchronise to incoming tones. The baud rate is programmable, so that both amateur, commercial and weather stations can be decoded.

There is a 4000 character 'type ahead buffer' so that you can compose a reply in the bottom part of the split screen whilst receiving in the top part. Ten pages of text are supported and can be called at will by typing numbers 0 – 9. This facility means that information about the station, the weather, the computer and so on can be written by the user before starting operations and then calling the pages when required. Several test phrases are held in the program, such as 'the quick brown fox' etc, and the software will also operate the 'push to talk' (PTT) line on the radio transmitter.

An 'Invert' command exists to reverse the mark and space parameters, and all conversations and information received by the user can be stored in memory, saved to tape or printed. Carriage return and other control characters are all automatic.

The cost of this fine program is £12 including post and packing for the cassette and £21 for the cartridge version.

The G4BMK program is complete, well written and reasonably priced. Anyone who is interested in transmitting or just receiving RTTY and who owns a Dragon 32/64 or TRS80 colour computer will find that this program will open up a completely new world on both the short wave and VHF bands.

Michael Kerry G4BMK who wrote this program is now working on a morse transceiver program, which he has promised to send in as soon as it is ready. Other plans include a Commodore 64 and Vic20 RTTY program as well as AMTOR for the Dragon and Tandy machines. If these programs are up to the standard of Michael's original, then he will have several winners on his hands. ■

Ray Berry GW6JJN

This series of articles is designed for [illegible] If you have any queries that [illegible] hints and tips to [illegible] that you would like to see covered write to: Ray Berry, Microradio, *Popular Computing Weekly*, 12-13 Little Newport Street, [illegible]



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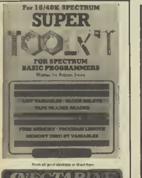
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Tony Bridge's Adventure Corner



Atmospheric

As in a dream, you see yourself stumbling down a great dark staircase All about you are shadowy images of struggles against fierce opponents and diabolical traps These give way to another round of images of imposing stone figures a cool clear lake "

What s this the latest Quicksilva cassette inlay? The start of a new-look *Dallas*?

Thankfully no, on both counts! It s the opening scene of *Zork III* the final part of the great Adventure trilogy from Infocom For my money (and you ll need quite a bit to be able to play them!) the Infocom programs are among the select few that manage to evoke a good sense of atmosphere of "being there

The other week, I quoted from a letter sent to me by Alan and Daphne Davis Later in the same later they to mention atmosphere (and here they are talking of Adventures for the Spectrum)

"One thing that s rarely if ever, mentioned in reviews is whether a particular program succeeds in creating a convincing world — atmosphere, if you like This of course is where *The Hobbit* wins hands down over all the others Both *Quest* (from Hewson), and *Knight s Quest* (from Phipps) create such an atmosphere quite well whereas Artic s *Golden Apples* seem rather dead by comparison One lacks a sense of purpose in such adventures After all it s not merely the intellectual problems of adventures that appeal — it s also the sensation of exploration But the world does have to seem worth exploring or we tend to lose interest '

Although the Davis's were speaking of Spectrum programs, there are of course many other Adventures for other machines How do they figure in the "atmosphere stakes?

At the start, I mentioned *Zork III* and Infocom Any of Infocom s Adventures can be relied upon to draw the player into a fantastic world and hold his interest while there The Zork Trilogy is easily the series that will be remembered above almost all other Adventures maybe only excepting the orginal *Colossal Cave* that started the whole venture of Adventure

None of the programs have any form of graphics, relying instead on the images conjured up by reams of text an example of which I quoted at the start Incidentally this the very start of *Zork III* goes on for several more lines and is quite typical with most locations being given a screen and a half of descriptive text — even combat is gone into a great detail

The total effect is like reading a novel, except that you the reader/player, can actually influence the action and its outcome — it can be quite thrilling to watch The other Infocoms *Suspended Planetfall Enchanter* and so on all follow the same pattern although each one has a unique twist to give added interest If you don t like all this text, you can ask the program to be brief after which the program will just give an abbreviated description of each scene They re very expensive but very, very good A couple of them *Deadline* and *Witness*, include in the packaging several bits of paper (case dossiers medical reports suicide notes matchbooks with scrawled phone numbers, news cuttings and so on) to heighten the realism while *Planetfall* includes whimsical space postcards Space Cadet's Manual and more *Deadline* and *Witness* are played in real time (or rather, computer time) all of which serves to increase the reality

This side of the Atlantic however there are Adventure authors to be proud of too Level 9 s Middle Earth Trilogy although not having the luxury of random access that a disc affords, with all the memory that provides for adding detail nevertheless manages to cram an awful lot of descriptive material into the text Little touches throughout the games ensure that the feeling of "being there is maintained throughout the series — in *Colossal Adventure* for example you will come upon a window through which you can glimpse a reflection of yourself, which waves back at you! You get no extra points for this, but it certainly adds to the atmosphere

Lords of Times the latest from Level 9, manages to take the player from the comfort of his own living room on a trip through no less than nine different worlds each one lovingly created in text only from a bleak sub-zero Ice Age to a warm and sleep English country garden (how do I get into the shed. someone?) Again, the feeling of actually walking through these segments of time is very strong

Scott Adams Adventures as you will know have been the training ground for many an adventurer and are held in great affection The text is rather dry and I find it hard to get personally involved in the adventure in the beginning sequences Although to my mind, they lack a little in atmospheric detail in the Scott Adams series the puzzle s the thing, and in this they are magnificent!

You may not like text adventures that witter on and on like *Zork* — that sort of flowery prose may be too rich for some players who want to get straight on with solving the puzzles of the adventure

There are two ways in which the good author draws his "prey" (that s you the player!) into his net The obvious one added graphics we ll deal with next week The second not-so-obvious way is seen working well in, for example *Knight s Quest* as mentioned in the Davis letter

KQ starts off in a rather unpromising fashion which, I have to admit put me off on first contact Almost non-existent descriptions (*Courtyard Sword* ") linked to extremely cartoonish illustrations didn t do much to suspend my disbelief — but after a dozen or so locations and several tough puzzles later, I found myself totally engrossed in the fantastic world of Mike Farley the author (As an aside, for anyone struggling in the early part of the adventure here are a couple of tips In a couple of weeks I'll take a look at the later stages of this fascinating program so let me know if you need a clue For now use the Adventure Corner substitution code starting at the second letter read every alternate letter until the end is reached and then return to the first letter repeating the process

TFOE MEAD KTEH AEFD RRIA EGNO DN

and

AIRN CTHH TEH C EALV EED* GSEE

KQ is for the Spectrum of course but for other machines as well there is a great series, of some 14 or 15 titles now from Channel 8 Software Regular readers will know that these are written by Brian Howarth, who has also undertaken the mammoth task of converting the Scott Adams adventures for the BBC and Spectrum (I can t wait to see them!) The Mysterious Adventures are similar to KQ in feel — short descriptions and rather unpromising starts Though the creepiest of any start to any adventure is that of *Circus* You are walking down a dark deserted country lane, having run out of petrol when you see, in a field a Circus All the lights are burning there is the sound of children laughing animals roar You push the gate open and all sound ceases! There is no one there! It s one of the best starts to an adventure that I ve seen Like KQ the Mysterious Adventures soon pick up and, without realising it, you are sucked into an alternate reality

This series of articles is designed for novice and experienced Adventurers alike Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter So if you have an Adventure you want reviewed or if you are stuck in an Adventure and cannot progress any further write to Tony Bridge Adventure Corner *Popular Computing Weekly* 12 13 Little Newport Street London WC2R 3LD

Peek & Poke



PIRACY NOT OK

Craig R Adamson of Marwood Square, Stockton on Tees, Cleveland writes

Q **Is it OK if I buy a program and transfer it to other tapes and then offer them for sale? I have lots of games and I've put the best ones on tape. Will I be able to sell these as well? None of them are of my own making.**

A No! If you look back over the past year's issues of *PCW* you will see that software piracy is a highly emotive subject, yet still people ask me the same question. While I am the first to admit that the law is still hazy, there is a concerted push for stiffer penalties for piracy.

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WHAT IS NODDY?

N Haynes of Parkdale Road, Sheldon, Birmingham, writes

Q **I have just sold my TRS 80, and I'm hoping to buy a Spectrum or a Memotech MTX-500. However I still possess my Tandy monitor, and wonder whether or not it can be used with one of the above computers. I have been told that I will need a de-modulator. Has the Memotech got sound and sprites? Who will be producing software for the computer in the future? Has it got CP/M, and what is Noddy?**

A The Tandy monitor has a composite video input, 2v peak to peak, so any composite video input will work. Though in the Tandy this is at 2v peak to peak, it would be quite possible to use the monitor on the Memotech and the Sinclair and no extra hardware should be necessary.

It is always hard to guess who will be producing software for any computer that is still quite new. The Memotech has good sound and sprites. Noddy is like a mini second language that is available on the Memotech and that can be used and accessed direct from Basic. Essentially it is a text, and format handling language. The machine could be CP/M compatible, but as far as I know this potential has not yet been realised, and no package is available.

BUILD YOUR OWN COMPUTER

N Hamer of St Andrews Road, Spennymoor, Co Durham writes

Q **I already have a Spectrum and a ZX81, but I would like to build a computer of my own. I have only seen one book on the subject, and that was quite old, and had out of date components in it. Can you tell me if there are any modern books for building a computer, and if so, where they can be obtained.**

A The only book I have seen on this subject is quite good but will demand a lot of time if you are to see the project through to the end. Luckily it is written around the Z80 microprocessor, which of course you have already had experience of in the two Sinclair computers.

The book is *Build Your Own Z80 Computer*; it is written by Steve Ciarcia. The publisher is Byte books, which is part of Mcgraw Hill. The ISBN is 007 01 09621. It is not a 'slapdash' 'do this' approach, instead it leaves some room for your own development.

DRAGON 32 — OR 64?

Jason Kells of Godmanchester writes

Q **With presents and things I have now saved and got enough money to buy a Dragon 32, which is the computer most of my friends have got. Now I see that there is a Dragon 64. Is this better? What are the differences, do you think I should save some more to buy this computer instead?**

A Personal opinions always come into questions like this — when one computer is compared to another. In this case it really depends on what you want your computer for. Essentially the Dragon 64 is just a Dragon 32 with some extra memory and one or two other things, most notably a RS232 interface, tacked on.

The disadvantages of the system are that it still has the same display with a lack of readily available lower case characters, and that the extra memory overrides the cartridge port — or rather the Basic does. This of course creates problems when more serious packages such as a spreadsheet or word processor are considered.

The advantages are that the RS232 allows more communication, and longer programs can be *Run* and that the 64 is fully compatible with the 32. In fact, when you switch on you in effect have a 32. The keyboard response has been sharpened, and some of the bugs have been taken out of the *Rom* to leave an efficient and good quality Basic. And of course, you can now link it with disc drives.

ONE TRACK MIND

Mr S Alg of Wandsworth Bridge Road, Fulham, London SW6 writes

Q **Could you please tell me the differences between a 40 track, and an 80 track disc drive? That is, what can you do with an 80 track, that you cannot do with a 40 track?**

A More often than not you are talking about single density (40 track) and double density (80 track) disc drives. While the actual storage capacity depends on the formatting of the disc, it is actually possible but unlikely to have a single density drive store more when used with a particular computer system, than the same size disc at double density, on another computer.

The reason stems from the way information is stored on a disc. Usually it is in forty concentric circles, called tracks, each track being divided into many segments. A segment might typically be 128 or 256 bytes big. Clearly it is easier to get 40 tracks onto a disc than 80. Because of this the quality of a double density disc has to be much better for it to be of use.

TYPEWRITER LINK UP

Mr T Webb of Wordsworth Avenue, Newport Pagnell, Bucks writes

Q **As the father of a new Spectrum owner, and with a wife who owns a Silver Reed electric typewriter, 2600C model SP 8700, I was most interested to read the letter from Lance Walton printed in your 22nd December issue. Could you tell me if it is at all possible that my wife's typewriter could be linked to my son's 48K Spectrum as a printer?**

A I'm afraid not. The 2600C model is a straightforward electro-mechanical portable with no expansion facilities. To quote Silver Reed: 'There's not a chip in sight'.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW*, 12-13 Little Newport Street, London WC2R 3LD.

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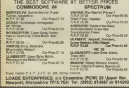
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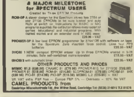
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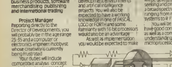
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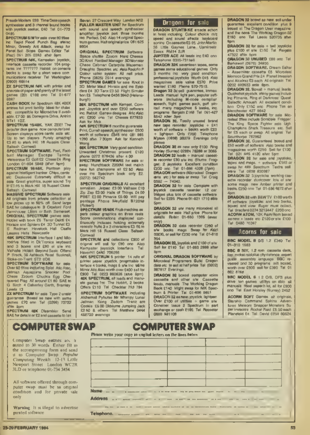
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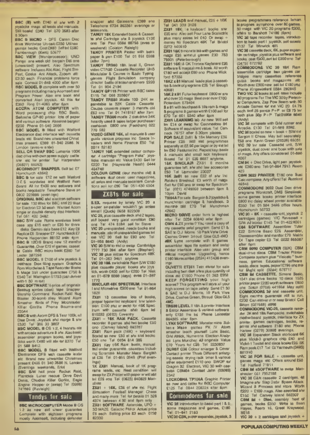
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ZX81 Ram pack (16K) + keyboard Boxed as new £60 of s/w and books £50 ono Tel 0834 814 365

ZX81 Key 16K Ram basic, manual still under guarantee cassettes including Scramble Monster Maze Bargain at £35 Tel 01-951 0845 (Pref evenings)

1K ZX81 Manual, book of 1K programs leads, etc Neat condition will swap for ZX Printer with paper or will sell for £25 ono Tel (0623) 640828 Mansfield

ZX81 + 16K, £35 of s/w inc Flight Simulation Football Manager Chess and many more Tel for details 01 328 4374 between 4.30 and 6pm only

ZX81 SOFTWARE Asteroids, UFO + 3D MAZE Galactic Patrol Actual price £6 each Selling price £3 each 0738 62330

ZX81 LEADS and manual, £25 + 16K Tel 041 339 3126

ZX81 16K I.e keyboard books s/w £25 ono Also sell Four Lane Scalextric plus many extras for £40 Or swap + money for Spectrum 48K Tel Bristol 0272 560610

ZX81 16K 5 months old with games and mags £35 without games £30 733 78201 (Peterborough)

ZX81 16K & DK Tronics Keyboard £35 software & magazines & book. All worth £180 will accept £80 ono Phone Wickford 67335

16K ZX81 Manual leads plus 3 cassettes & pack of programs £35 Tel Slough 40681

16K ZX81 Fuller keyboard £800 or s/w s/w over 35 mags Best over over £100 Rotterdam 578404

ZX81 with touchpad & 16k ram & mags & programs & games worth £100 sell for £70 Tel 601 0340 after 6pm

ZX81 LEARNING lab As new Will sell for £14 or swap for Commodore 64 Software of equivalent value. Tel Cannock 78757 after 5.30pm please.

FOR SALE ZX81 & 16k Memory £35 Printer £35 Will sell programmes separately at £2.50 per tape or by the lot for £50 Features Inc. Repeat key basic & manuals s/w small kick keyboard Boxed Tel 01 636 8687 anytime.

16K SINCLAIR ZX81 6 months guarantee left. s/w s/w few accessories £50 Tel Upminster 23037

16K ZX81 as new £22 of s/w inc Rainbow Breakout £3 worth of mags Sell for £50 ono or swap for Spectrum Tel (021) 4745060 between 6pm & 10pm David

TI994A For sale Bargain & 2 joysticks & munchman cartridge & handbook. 3 months old £70 Tel Munchman 42642

MICRO DRIVE order form to highest offer Tel 0256 60840 after 6pm

OWN A ZX printer? You need a copy of my cassette label program Send £1 & SAE to D.J Morris 19 Park View Drive Cashes Green Stroud Glos GL5 4NO

48K Lynx complete with 6 games assembler tape file system and serial printer interface Also user group and official magazines Upgrading, hence £160 Morecambe (0524) 415436 evenings

OLIVETTI ET351 Twin drive for sale including twin disc drive plus quantity of discs etc £1500 Phone 01 363 0358

KEEP FORGETTING your high scores? This program will store all your high scores on tape safely Send £1 50 & SAE to D.J Morris, 19 Park View Drive, Cashes Green, Stroud Glos GL5 4NO

TRS80 LEVEL II 16K & printer interface & Editor Assembler & various software only £120 the lot Phone Leicester 664365 after 6pm.

LYNX SOFTWARE Monster mine Sultan's Maze games PK IV Atom smasher teach yourself Lynx Basic, Grid Attack, Numerons Election Analyst Lynx Muncher All originals Value £70 Yours for £35 Tel 2230837

DURST C35 Colour enlarger & Cover Contact printer Three Different enlarging easels drying rack timer & various other equipment £110 ono SWOP for Dragon 32 Electron, VIC 20 with cassette CBM64 Contact John (03083) 2342

LECKOSHA TP106A Graphic Printer as new and cable for BBC Computer £125 Tel 0844 208224 after 6pm

Commodores for sale

VIC 20 introduction to basic part I & II some magazines and games, £160 Tel 01–841 2153

VIC 20 C2N, super expander, joystick, 3 books programmers reference leman (?) progress symphone over 80 games 50 mags with VIC 20 programs £200, offers to Barshott 74180 (6pm)

VIC 20 tape recorder tapes, introduction to basic part I joystick, sell cassette £137 Tel Winwick 481

VIC 20 cassette deck, 8K, super expander cartridge joystick plus software and books cost £500, sell for £200 ono Tel (0475) 872782

COMMODORE VIC 20 16K Ram assemble cartridge two games cartridges many cassettes reference guide books and magazines etc Worth over £500 new sell for £180 pnd Phone Kingswinford 0384 292845

TWO VIC 20 books to sell titles include 30 programs For The VIC 20 by Personal Computers, Zap Pow Boom with 30 Arcade Games for the VIC 20 £4 75 each and 25 pence P+P or £8 75 for both plus 30p P+P Tel:01868 8640 (Andy)

VIC 20 complete with Grid runner and Arcadia. £130 Tel 01-868 8392.

VIC 20 boxed as new + book + S/W inc Sargon II Chess May sell separately £60 ono Kevin Green (09328) 65031

VIC 20 for sale Cassette unit, S/W joystick, dust cover and book with sale of mags. Any offers considered 01-866 6007

CBM 64 + Disc Drive, light pen joystick etc £380 ono Tel 01-864 7913 Room 423

CBM 3022 PRINTER £180 ono Sual Calc complete Any offers! Tel Romford 46948

COMMODORE 3032 Dual Disc drive programs Wordcraft, DMS Simplesoic some games books printer interface £800 inc daisy wheel printer available £350 Tel 01 504 3496 office hours. Hornchurch 55733

VIC 20 + 8K + cassette unit, joystick 2 cartridges (games) VIC Revealed + S/W All boxed £145 Tel 01-422 6001

C64 SOFTWARE Assembler Tutor £22 Simons Basic £25 Assembler, Disassembler and monitor £70 Matrix £4 Tape copier £3 Tel 0222 865067 after 6pm

CBM 8096 COMPUTER (32K) CBM dual-drive discs CBM Tractor Printer Complete system plus "Visicalc" business, games Educational software leads discs tapes, paper! £795 ono the lot Might split (0244) 678717

CBM 64 CASSETTE. Simons Basic, 1541 disc drive books 10 discs 1525 printer paper £250 worth software £650 ono Solon (0709) 441664 May split!

COMMODORE 64 and cassette unit. Eight months guarantee still to run. £200 Can deliver in or near Bristol Call Brian (027688) 4096

COMMODORE VIC-20, cassette recorder 3K and 16K Rampacks switchable motherboard joystick, interface for ZX printer games cartridges, books, reprints and software £180 ono Phone Harlow (0279) 30906 evenings.

VIC 20 Expansion Stack motherboard 6K plus Vickit-3 graphics chip £40 and Vickit-1 Toolkit and discs books £35 8K Ram pack £17 Tel Gt Yarmouth (0493) 661310

VIC 20 FOR SALE + cassette unit, games mags etc Offers around £60 Tel Hatfield 71911

CBM 64 SOFTWARE to swap Manchester 061 7952188

VIC 20 C2N cassette 2 cartridges. 40 Imagine s/w Slap Dab Space Attack Wizard & Princess and more Worth £220 + £100 mags. Also assorted s/w £150 Tel Canvey Island 682307

CBM 64 + Disc, assembly host of games, books £350 Write to Sean Hayes, Room 15, Great Kraywood SE16

VIC 20 + 2 cartridges and joystick +

cassette games and mags Ad new £80 Tel 01-868 9675 after 5pm

VIC 20 S/W FOR SALE. All originals inc Matrix Arcadia Tel Harlow (0279) 37829

VIC 20 WITH CASSETTE. 3K Super Expander 16K Expansion, 2 cartridges (games) £150 Miss 01-701 4115

COMMODORE 3022 PET Tractor feed printer IEE interface input £120 Tel Aberdeen (0224) 821528

COMMODORE PET Basic 2 utilities, less than half price Toolkit £10 Super chip £12 Arrowpagewriter £29 Simplcalc (tape) £10 Phone 01 579 6282 after 6pm

THE COUNT VIC 20 Adventure cartridge for less or will swap for 3K on 8K Ram on super expander Tel Rob (Harrogate) 0423 886206 after 4pm

VIC 20 & CN2 32K Swisheis Ram pack intro to Basic 1&2 Tomb of Drewarn start Mok Pharohs Tomb free Adventure cartridges Dust Cover £180 Tel Remford 46719 evenings.

VIV 20 & Accessories and s/w ring for details (0438) 314086

VIC 20 & 8K Ram m.c months 1 games cartridge & plus s/w £100 Tel 021 704 2036

VIC 20 & C2N Instructions to Basic & 4 games £90 2 months old as new Tel 01 205 7948

VIC 20 & C2N cassette unit, joy stick, s/w mags and books. Sell for £110 or swap for 48K spectrum with s/w Tel Kiran 01 572 6725

COMMODORE 64, C2N cassette, s/w Inc Munhoman Hobbit & Books. £220 ono Tel 01-341 4602

COMMODORE 64 3 months old 5 yr guarantee cassette recorder s/2 e g Hobbit £350 Treharne 410603

32K VIC 20 (switchable) & 8 top games & Books & Cassette Deck & Joystick & Mags all cost over £300 Much better value than the starter pack at £170 86 Telephone Steve on Coventry 412808 after 5 00pm

COMMODORE 64 & 1541 Disk Drive & Easy script & games & books manuals & macro-assembler development system and 22 data file disks 3 months bal. worth £480 Sell for £380 all still under guarantee Phone (Oxford) 54084

Ataris for sale

BRAND NEW ATARI VCS with Pafel and Combat, best £95 ono Chesham 785285

ATARI 800 48K, including manuals, programme recorder joysticks £80 of software worth £200 will sell £160 Tel (0625)27306

ATARIC VCS plus joysticks paddles and 7 cartridges Combat, Space Invaders, Asteroids, Missile Command Night Driver Street Racer and Air/Sea Battle All perfect condition £70 ono Tel Derby (0332) 512043 after 6pm

ATARI 800 48K with cassette recorder 5 cartridges inc Pole Position 7 cassettes the Mc Beer Max, sale joystick approx £710 sell for £400 Torquay 22068

ATARI VCS, as new with Pac Man £65 or swap for 48K Spectrum with £15 lee S/W or tape recorder needed only manuals and lead required Tel 0738 24823 Perth

ATARI VCS, excellent condition 5 cartridges inc Space Invaders Asteroids Super Break-out cost £199, accept £90 Brentwood 223817 eves

ATARI CASSETTE Enhancer + Magic Window Mint condition £10 for both Will not split (Not XL) phone Paul 021 422 4167 after 6pm

ATARI 800 (48K) (inc new 1050 disc drive 1010 cassette deck and 850-RS 232 Parallel Printer Interface (Epsom cable) Microsoft Basic Baer Writer Action at Ram version and assorted games £550 Tel Slough 71382.

ATARI VCS + 11 cartridges worth over £400 will accept £175 ono Phone Wickford 67336

ATARI 400/800 Zaxxon Zeppelin Blue Max Astro Chase Combat Leader Submarine Commander £12 each Program Recorder £20 01-697 1908

ATARI VSC with seven cartridges Sky Diver Bowling Street Racer Maze Craze Video Olympic, Code Breaker with touchpack joystick and paddles £65 Tel 0255 830685

ATARI 48K 400/800 wanted sale 510 disc drive Tel 021 564 2992 (Chris)

ATARI ROMS, Star Raiders Mountain King River Rescue Cass 16K controller for OK Gorley Nukewar Rome £15 each cassette £10 each or will swap for Atari 850 or Modem or why Kim after 6pm 0288 558037

ATARI VLS CONSUL, 4 cartridge games holder £55 Tel 0665 340 987

ATARI VLS with 15 cartridges including Vanguard PacMan £150 ono Tel 01-863 4238 evenings only

ATARI 800 + 48K + Disc Drive and cassette unit plus £280 of games inc. Fort Apocalypse Saptr Defender Donkey Kong Miner 2049ER Mr Robert, Dragontye £400 Tel Ascot 21180

ATARI VCS 8 cartridges frogger, Santa ... defender ... randlers, £110 microdrive order form — highest offer Tel 758 474 (Romford)

ORIGINAL SOFTWARE for Atari 400/800 Chopllfter disk £15 Gomoku disk £8 SYN Assembler disk £29 Fastgammon cassette £5 Le Stick joystick 08 Tel Chelmsford (0245) 269030

ATARI VCS cartridges for sale, Jungle Hunt Raiders of The Lost Arc, £18 each or £40 the lot. Ring Julie (0005) 662836 after 6pm

ATARI VCS Good conditions & 2 cartridges £60 00 Tel 01 541 4894

ATARI 810 disc drive as new in box 6 weeks old £1300 of s/w inc disk drive Bargain at £300 No offers. Tel Glossop (456) 5408

ATARI VCS 6 cartridges £80 Tel Grays Thurroch 70623 after 6pm

ATARI VCS. Six Cartridges, Space Invaders Missile Command Combat, Adventure Night Driver Street Racer extra paddles V G C £120 Jupiter Ace 16K Ram Pack, Four Teces £80 Tel 784 7759 evenings

ATARI 800 48K basic cartridge cassette recorder de-re Atari and original manuals three joysticks two paddles for cartridges eight games cassettes and four language courses Worth £900 offers around £600 (0256) 83199 (Basingstoke)

ATARI 800 16K Ram packs for sale £30 each Baer MX80 or FX80 printer wanted Tel Coventry 0208/70082 (eves)

ATARI 400 16K, with basic cartridges, joysticks two months old £180 Monday to Friday 4pm onwards Tel 061 330 7116

For sale

ZX PRINTER £25 one Tel 0705 4753361

CASIO FX802P Pocket Computer/Scientific Calculator + FA3 cassette interface built in printer programmable to 1568 steps Manual etc Worth £115 Perfect condition 2 months are just £85. Phone 0622 75386 Patrick.

CARTRIDGES for sale! All at cheapo prices! All perfect condition All for vic=20 Only £7 each! (inc. road race, princess cows avenger seeded castle) Tel 0743 60890 (Michael)

SHUGART 100K drive for BBC with 40 diskettes (cost approx £280) sell £220 ono or might split Ring 01-672 2817

ORIC-1 for sale Only £76 Cassette and accessories included gift unused guaranteed Tel Crawley 518480 Weekends and after 6pm weekdays only

ZX PRINTER paper Sinclair origin in original wrapper Ten rolls available will split Ring Derek on Ware (0920) 2582 evenings

KEMPSTON INTERFACE + 3 conversion tapes £20 3D combat game £3 Zip Zap Aquarius £2 Ask for Gareth after 6 30pm 01 393 3909

FED UP paying £3 for one game? Three excellent spectrum games force lawn brake for £2. Send cheque P O payable to Menksoft Highlands Blue Boys Path Minchinhampton Stroud Glos GL6 9JT

ZX MICRODRIVE + Interface 1 £65 Tel 0625 877419

MICROTON 80 singleboard with unexpanded expansion + PSU £40 or offer Tel (Slough) 0753 493 42.

PRISON VTX 500 Prestel/micronet adapter for spectrum unused (unwanted gift) £90 ono Tel 01-387 (1) 3023 eves or weekends.

SALE OR SWAP TI99/4A + joystick and one cartridge (Music Maker) for £110 ono or swap for Spectrum Tel Alla (0903) 886469

LYNX SOFTWARE. Gempack 3/4 Sultan's Maze Oh Mummy Spanner Man Grid Attack all £4 each Colossal Adventure Adventure Quest £5 each or £30 the lot Ring Stafford (0785) 561745 after 5pm

THE ORD, lak net pase go. Soft talk II software complex, Sinclair feed to Road feel club recorder Re Asteroids All for sale at half price or consider swap for TV games Also 12 Philips 1700 video cassette. Tel 01 580 8738

New Releases

BLACKSTAR

Castle Blackstar looks like generating enough questions to keep Tony Bridge employed for another year, at least It is a machine code program for the 48K Spectrum that should have the hardened addicts rubbing their hands with glee

Text only — you are set the quest of recovering a magic orb and bringing it back to the mysterious Lady Artemis

The program has a vocabulary of over 200 words and can understand complex instructions like "Take Lamp and Light it" A quick glance suggests that it's a cut above the usual standards and could well become a classic

The company plans to issue versions of the game for the Dragon 64, Commodore 64, and Apple II in the near future The program is the first in a planned series of related adventures from the company

Program *Castle Blackstar*
Price *£8 95*
Micro *Spectrum 48K*
Supplier *SCR Adventures*
190 Shelbourne Road
Tottenham
London N17

SNOWMAN

A good many of us may have had our post Christmas depression relieved by the showing of *The Snowman* a cartoon adaptation of Raymond Brigg's magical book

Now you can play the computer game of the cartoon *The Snowman* captures the gentle spirit of the original book and manages to produce an exciting game without a trace of violence

The screen layout is a little like *Burger Time* — you must move a little boy along ledges and up ladders collecting the snow with which to build the snowman

Once built, he must be dressed with scarf nose, buttons, eyes and most important of all, his smile Later screens have you collecting toys and ice

The task is impeded by flames that dart around melting the snow you are collecting — forcing you to go back and get some more There are also some sleep monsters who can be frightened off by an alarm clock

The worst thing that can happen in this game is that the little boy uses up his four goes and slips back into bed Wholly admirable and beautifully designed

Program *The Snowman*
Price *£6 95*
Micro *Spectrum 48K*
Supplier *Quicksilva*
13 Palmerston Road
Southampton
Hampshire
SO1 1I1

BLACK HOLE

For lovers of the miniscule detail and complex strategies that go to make up wargames *Galaxy Adventure* could be just the thing It's an epic, real time, space adventure game with your Spectrum controlling the moves

Playing the game is not a matter of fast reactions but of careful planning and judgement — what weapons should you use? How much defence power is necessary?

There are all kinds of other features in the Universe including meteor storms and black holes which all pose their own unique threats The game comes with an extensive manual and retails for an unprecedented £2 75 Highly recommended

Program *Galaxy Adventure*
Price *£2 75*
Micro *Spectrum 48K*
Supplier *Alpha Software*
Old Elms
Rectory Walk
Gamston Retford
Notts DN22 0QE

3K GAMES

As a masterpiece of condensed programming apart from anything else *Games Designer* from Galactic Software deserves a mention — it gives you the ability to create games to (within limits) your own specification on an unexpanded Vic 20 ie in 3K

Although you are basically restricted to 'get past the aliens' type games, the program has a remarkable number of features You can design your own characters and sound effects, as well as controlling things like where the player starts on screen and where he has to get to

The [illegible] but simple [illegible] cassette comes with three games for you to start with All are reasonably fun to play

Program *Games Designer*
Price *£9 50*
Micro *Vic 20*
Supplier *Galactic Software*
Unit 7
Larchfield Estate
Dawlish Ford
Somerset

THE STING

Arcade thrills for bee keepers everywhere *Sting 64* is an arcade style game in which the plot is heavily bee orientated

In the first screen you defend a garden of hives using your bee swarm, then you chase off some raiders and finally defend the queen bee

It's fairly straight forward break the joystick stuff, but this being a Commodore 64 program the graphics are excellent and the game is fairly addictive

Program *Sting 64*
Price *£7 95*
Micro *Commodore 64*
Supplier *Quicksilva*
13 Palmerston Rd
Southampton
SO1 1I1

DON'T PANIC

Unlike the Spectrum, the Oric is not plagued by four hundred versions of *Apple Panic* — there may just be a dozen or so *Digger* is the latest version and, unlike some of the others, is all machine code It is also

CONVEYOR BELT TO OBLIVION

Having said some unkind things about Virgin's games in the past it's nice to be able to say that *Them* for the Oric 1 is a vast improvement on their usual standard

It's a five part arcade style game requiring both dexterity and logic Each section is quite different from the last and all are written in machine code

The first section involves avoiding various bouncing aliens as you make your way to an exit — later sections involve building towers out of blocks and stopping a conveyor belt that is taking you to oblivion The game also includes a special practice mode in which you can try all the screens

Program *Them*
Price *£5 95*
Micro *Oric 1*
Supplier *Virgin Games*
61 63 Portobello Road
London W11 3DD

(doubtless for sensible reasons) *Saved* at 300 baud. This means that if you think you might fancy a quick game in the morning before you go off to school, you'd better load it up the previous night — it takes a long time.

The game itself involves a network of ladders and platforms about which are scattered a number of bundles of treasure. The levels are patrolled by some nasty monsters whom you can only defeat by digging a hole and luring them into it. As good a version as any.

Program *Digger*
Price *£6.95*
Micro *Oric 1*
Supplier *Mercury Microware, 1 Duxford Walk, Moston, Manchester 10, M10 9JN*

DR FRANKY AND THE MONSTER

Virgin Games has just issued the latest in its — seemingly monthly — batches of new software.

Dr Franky and the Monster is for the 48K Spectrum and is roughly (very) *Manic Miner* in form. There are nine screens, each laid out slightly differently — there are several objects which you must collect and then take to your monster which will flicker into life.

Like *Miner* the controls are simple — left, right and jump.

Reviving the monster is made difficult by various strange square shaped objects that block your path.

The graphics are large, although a bit flickery, but other than that the game hasn't much to distinguish it.

Program *Doctor Franky and the Monster*
Price *£5.95*
Micro *Spectrum 48K*
Supplier *Virgin Games, 61-63 Portobello Road, London W11 3DD*

CRYSTAL CLEAR

Doubtless the more mystical among you will be familiar with the poetic prophecies of Nostradamus where the secrets of the future were revealed in the form of four line quatrains.

Of course the great alchemist himself (Nos to his friends) constructed the quatrains after long hours of meditation dwelling on the secrets of the Universe.

For those of us who don't seem to find the time to dwell on secrets the way we would like to, a new program called *Crystal* allows your BBC B to do it for you.

The program uses various randomising processes and a data base of suitable words and phrases to enable your BBC B to produce Nostradamus style quatrains — all about as convincing as the originals.

Program *Crystal*
Price *£3.45*
Micro *BBC B*
Supplier *Scientific Software, Old Loom House, Back Church Lane, London E1 1LS*

INSIDE STORY

Islets of Langerhans is a text adventure where the setting is not middle earth, but the even more mysterious region of inner space (as it used to be called in the sixties) ie the human body.

Your task is to travel through a human body and find the islets — then you have to find your way out again. If it sounds familiar then you've probably seen the film called *Fantastic Voyage* in which Raquel Welch played a female scientist who was miniaturised and injected into somebody's blood stream.

Back to the adventure — it's all machine code and is text only. The kinds of baddies you'll find in the game include enzymes and bacteria rather than goblins and elves. I am almost certain there is not one magic ring anywhere to be found.

Program *Islets of Langerhans*
Price *£4.00*
Micro *Spectrum 48K*
Supplier *Amazing Games, 39 Maple Drive, Burgess Hill, West Sussex, RH15 8EX*

YORKIE

Delivery is an interesting sounding game which combines a mixture of arcade and tactical styles.

Your task is to deliver various goods to different locations which are linked by a road network constructed by the computer.

Your journey is made difficult by a series of dead ends, one ways, speed restrictions and other road hazards. You are also burdened with a co-driver who will abuse you from time to time and a back door on the van that occasionally flings open, making it possible for you to lose your load.

Successful delivery of loads and avoidance of fines, etc earns you money — earn enough and you are given a holiday. Earn under £10 and you are fired. Life under capitalism eh?

Program *Delivery*
Price *£7.50*
Micro *BBC B*
Supplier *Paean Systems, Little Bealings, Woodbridge, Suffolk IP13 6LT*

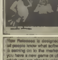
ARTIC ROLL

Pengwyn is an arcade game set in some Arctic wastes where you, not unexpectedly perhaps, are a penguin.

However, being a penguin does not materially affect the plot in any way which involves moving some flashing blocks into a straight line.

This simple sounding task is made difficult because you must find your way around various chunks of ice which are blocking your path. The time spent avoiding or melting the ice enables various 'nastles' to pursue you. You must avoid them — your score on each screen depends on how quickly you can complete the task.

Program *Pengwyn*
Price *£6.95*
Micro *BBC B/Electron*
Supplier *Postern Limited, PO Box 2, Andoversford, Cheltenham, Glos GL54 5SW*



New Releases is designed to let people know what software is coming on to the market. If you have a new game or utility which you are about to release send a copy and accompanying details to New Releases, Popular Computing Weekly, 12-13 Little Newport Street, WC2R 3LD



Top 10

Atari
1 ( ) Rally Speedway (Adventure International)*
2 ( ) Zaxxon (Datasoft)
3 (6) Enchanter (Infocom)†
4 (–) Saga 4 Voodoo Castle (Adventure International)
5 (8) Caverns of Kafka (Cosmi)
6 (5) Warlock (Callisto)†
7 ( ) Arrow of Death Part 2 (Channel 8)
8 ( ) Zork I (Infocom)†
9 ( ) Savage Pond (Starcade)
10 (4) Atari Chess (Parker Chess)*
* Cartridge †32K Cassette or disc
(Figures compiled by Lasco Computers, Birmingham 021 632 6458)

BBC*
1 (2) Planetoids (Acornsoft)
2 ( ) Arcadians (Acornsoft)
3 (6) Snapper (Acornsoft)
4 (1) Rocket Raid (Acornsoft)
5 (3) White Knight Mk2 (BBC)
6 ( ) Missile Base Acornsoft
7 ( ) Killer Gorilla Program Power
8 ( ) Starship Command (Acornsoft)
9 (5) Meteors (Acornsoft)
10 (7) Missile Control Gemini
* All Model B.
(Figures compiled by Alecs Management, Ipswich 0473 58181)

Spectrum
1 (1) Atic Atac (Ultimate)*
2 (5) Chequered Flag (Psion)*
3 (4) Manic Miner (Bug-Byte)*
4 (2) Lunar Jetman (Ultimate)*
5 (10) Flight Simulation (Psion)*
6 (8) 3D Ant Attack (Quicksilva)*
7 (3) Slinkers (Imagine)*
8 ( ) Kong (Ocean)*
9 ( ) Jet Pac (Ultimate)
10 ( ) The Alchemist (Imagine)*
* Requires 48K.
(Figures compiled by W H Smith and Son London)

Books
1 ( ) Winning Games on the Commodore 64 Books (Horwood)
2 (6) Advanced User Guide for the BBC Micro *Bray* (Cambridge Micro Centre)
3 ( ) Using the 64 *Gerard* (Duckworth)
4 (2) Mastering Machine-code on Your ZX Spectrum, *Baker* (Interface)
5 ( ) BBC Micro Compendium *Ruston* (Interface)
6 ( ) Advanced Programming Techniques for the BBC Micro, *McGregor and Watt* (Addison-Wesley)
7 ( ) Build Your Own Expert System *Naylor* (Sigma)
8 ( ) Starting Forth *Brodie* (Prentice Hall)
9 (8) Commodore 64 Programmer's Reference Guide *Commodore* (Commodore)
10 (10) 68000 Assembly Language Programming *Kane and Leventhal* (Osborne)
(Figures compiled by Watford Technical Books Watford 0923 33134 Prestel 28844)
(Last week's position in brackets)

VIC 20
1 (–) Megagalactic Llamas Battle at the edge of time (Llamasoft)
2 (1) Wizard and the Princess (Melbourne House)
3 (1) Wacky Waiters (Imagine)
4 (4) Gold Runner (Llamasoft)
5 (3) Snooker (Visions)
6 (6) Bewitched (Imagine)
7 (7) Catcha Snatcha (Imagine)
8 (8) Arcadia (Imagine)
9 (–) Sky Hawk (Quicksilva)
10 (9) Abductor (Llamasoft)
(Figures compiled by Boots/Websters)

COMMODORE 64
1 (–) Revenge of the Mutant Camels (Llamasoft)
2 ( ) Model Wimpy (Ocean)
3 (3) Crazy Kong (Interceptor Micros)
4 ( ) Manic Miner (Software Projects)
5 (–) Hunchback (Ocean)
6 (1) Space Shuttle (Microdeal)
7 (2) Falcon Patrol (Virgin)
8 (–) Grandmaster Chess (Audiogenic)
9 (7) Motor Mania (Audiogenic)
10 (9) Ship of the Line (Richard Shepherd Software)
Figures compiled by Boots/Websters

DRAGON 32
1 (1) The King (Microdeal)
2 (2) Eightball (Microdeal)
3 (3) Shramble (Microdeal)
4 (4) Leggit (Imagine)
5 (6) Transylvanian Tower (Richard Shepherd Software)
6 (7) Dragon Chess (Oasis)
7 (9) Grand Prix (Salamander)
8 ( ) Cuthbert in the Jungle (Microdeal)
9 (–) Devil Assault (Microdeal)
10 (–) King of Darkness (Wintersoft)
Figures compiled by Boots/Websters

ZX81
1 (1) Football Manager (Addictive Games)
2 (2) Flight Simulation (Psion)
3 (2) Asteroids (Quicksilva)
4 (8) Krazy Kong (PSS)
5 (5) Invaders (Quicksilva)
6 (5) Space Raiders (Psion)
7 (4) Mother Ship (Sinclair)
8 (8) Defender (Quicksilva)
9 (–) Hopper (PSS)
10 (–) Espionage I (Artic)
Figures compiled by Boots/Websters

Book Ends

VOLUMINOUS

Someone should tell Ian Sinclair to take a holiday — he seems to spend every waking moment writing books on every micro under the sun

Latest product of his voluminous output is *Electron Machine Code for Beginners*

Ninety nine per cent of all machine code books are exactly the same in format — it goes something like this Machine code and why it's wonderful central processor Hex Dec

Ins and Outs Stacks and Relative jumps, etc , etc

Ian Sinclair's book adopts roughly this format but, partly because he writes clearly and concisely and partly because the Electron has a built-in Assembler, he manages to go more deeply into the subject

Book	*Electron Machine Code for Beginners*
Price	*£6 95*
Micro	*Electron*
Supplier	*Granada Publishing 8 Grafton Street London W1X 3LA*

WINNING

Winning Games on the Commodore 64 is not actually about winning games on the Commodore 64 at all — the slightly misleading title means, I think, winning in the sense of 'winning smile'

In fact, though, the book is excellent The first section covers basic games writing information like sprites, sound and joystick control The book ends with a series of programs, most of which are of high quality

Book	*Winning Games on the Commodore 64*
Price	*£5 95*
Micro	*Commodore 64*
Supplier	*Ellis Horwood Cooper Street Chichester Sussex*

This Week

Program	Type	Micro	Price	Supplier
O Level Geography	Ed	Dragon 32	£8 95	Abacus
164 Programs	Arc	Spectrum	£11.95	Prentice Hall
1988	Ad	Spectrum	£6.95	Vision
Armageddon	Arc	Commodore 64	£8.95	Vision
Artist	Ut	Dragon 32	£5.00	Abacus
Author	Ut	Oric	£14.50	Tansoft
Aztec Challenge	Arc	Commodore 64	£12 95	Audiogenic
Banana Drama	Arc	Commodore 64	£9 95	Vision
Bongo	Arc	Commodore 64	£7.95	Anirog
Boogie & Classics I	S	BBC	£4 95	Broadway
Boogie & Classics II	S	BBC	£4.95	Broadway
Cosmic Command	Arc	Commodore 64	£6 95	Anirog
Cybotron	Arc	Commodore 64	£7 95	Anirog
D Bug	Ut	BBC	£7 95	Enigma
Defenda	Arc	Spectrum	£6 90	Interstella
Diamond Quest	Ad	Spectrum	£8 00	CCS
Eagle	Arc	BBC B	£7 95	BBC
Editor Assembler	Ut	Commodore 64	£16.95	Duckworth
Espionage Island	Ad	Commodore 64	£6.95	Artic
Exploring Adventures	Ad	Spectrum	£7 95	Duckworth
Extended Basic	Ut	Commodore 64	£12.50	Duckworth
Forbidden Forest	Arc	Commodore 64	£12.95	Audiogenic
Frantic Freddie	Arc	Commodore 64	£12.95	Audiogenic
Golden Apple	Ad	Commodore 64	£6 95	Artic
Gusher	Arc	Commodore 64	£6 95	Vision
Hurg	Ut	Spectrum 48K	£14 95	Melbourne House
Inca Curse	Ad	Commodore 64	£6 95	Artic
Indian Attack	Arc	Commodore 64	£6.95	Anirog
Island Adventure	Ad	Commodore 64	£7 95	Duckworth
Italian	Ed	Oric	£12.95	Tansoft
Jungle Drums	Arc	Commodore 64	£7 95	Anirog
Klartz & the Dark	Ad	Dragon 32	£8.95	Dragon Dungeon
Klartz & the Dark	Ad	Commodore 64	£8.95	Dragon Dungeon
Krakatoa	Arc	Spectrum	£5.50	Abbex
Marooned	Ad	Vic 20	£4.95	Buttersoft
Measuring Instruments	Ed	Dragon 32	£8.50	Abacus
Metrical	Ut	Dragon 32	£8.50	Abacus
Moon Buggy	Arc	Spectrum	£5.95	Visions
Music Tutor	Ed	Dragon 32	£8.95	Abacus
Optima	Ed	BBC	£9.90	Compusoft
Paratroopers	Arc	Commodore 64	£5.50	Rabbit
Pedro	Arc	Spectrum	£5.50	Imagine
Pegasis	Arc	Commodore 64	£12.95	Audiogenic
Planet of Death	Ad	Commodore 64	£6.95	Artic
Ship of Doom	Ad	Commodore 64	£6.95	Artic
Slinky	Arc	Commodore 64	£12.95	Audiogenic
Space Pilot	Arc	Commodore 64	£7.95	Anirog
Star Base Defenda	Arc	Commodore 64	£5.95	Anirog
Star Dossie II	Ut	Dragon	£6.95	Gough
Ten Little Indians	Ad	Spectrum	£6.95	Digital Fantasia
Ultimite	Ut	Spectrum	£5.95	Microholics
Zodiac	Ad	Commodore 64	£7.95	Anirog

Key: Ad — adventure/Arc — arcade/Ed — education/
S — strategy-simulation/Ut — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to This Week Popular Computing Weekly 12 13 Little Newport Street, London WC2R 3LD



Creative pastimes

One of the most pointless pursuits known to humans must be chess What a waste of time

You spend all that time to no productive purpose for what good does it do? What does chess playing do that is at all useful? About all that can be said in favour of playing chess is that it keeps the manufacturers of chessmen the writers and publishers of chess books and similar leeches, gainfully occupied

Another similarly wasteful and pointless activity is that of painting, because paintings neither keep the rain from one s head nor can they be eaten for sustenance The only useful aspect is that paintings can cover the mould on the wall

We as a nation support wasters in higher education who take pointless degrees in subjects such as English Literature Drama, or (how pointless can you get?) Philosophy What good are graduates in these disciplines because they only lengthen the dole queues? We would not have as many problems as a nation as we do, if we had not allowed so many youngsters to become sociologists

All we need to solve Britain s (and the world s?) problems is to produce people with practical skills and — as we all know — home computers are immensely impractical devices All one can do with home computers (without vast extra expense) is zap aliens, delve into dungeons and that s about it — home computers like chess or painting are pointless pursuits

Only one word can summarize the foregoing The word is RUBBISH (There is I suppose perhaps more than one word)

Chess painting computers degrees in English Drama, Philosophy and Sociology are all subjects or pastimes which allow the individual person to become a creative individual The true point to chess is that it is of no practical applicability but the mental exercise involved in coming to terms with the game is truly beneficial and so with the others

Creativity is allowed is encouraged but does not come unless the individual is ready to welcome the opportunity The list of similar subjects is quite long, and includes most subjects at present unpopular with the narrow minded promoters of 'practical subjects

To have a computer at home does not mean that the individual therefore becomes a creative individual Two extreme (and mindlessly uncreative) responses are either one, to sacrifice one s life to games or two to dislike games and believe that is all there is to computing Both these fanatics have entered an uncreative mindless world

If one s knowledge of Basic does not extend beyond the level to type in more games (and never write a game for oneself) or one s conception of computers does not extend beyond a mundane desire that computers be practical by sympathies Computers are one of the ways in which the creative person can exercise creativity

The initial excitement of a person owning or using a computer soon wears off and if that excitement did not wear off then one would suspect the person s complement of grey cells The question is What next?

To the mundane the answer is Nothing practical to the creative, the answer is Who knows? One can only try ■

Boris Allan

Spoted numbers

Puzzle No 95

Look at this series of numbers 16 25 36 49 169 256 289

you may have spotted

You may have spotted that each of these numbers is a perfect square but can you see any other property common to them all?

The next number in the series is 1369 the square of thirty-seven and the important point is that each of these numbers has its digits arranged in ascending order the numbers listed being the eight lowest possible

What is the highest perfect square in which the digits are all in ascending order?

Solution to Puzzle No 90

The first part of the problem involves finding a right angled triangle in which one of the non hypotenuse sides is 47 units and the other two sides are an exact number of units in length

Once this is found the bearing can be found by calculating the inverse cosine of 47 divided by the length of the hypotenuse Many micros calculate in radians rather than degrees so the value should be converted if this is the case (Line 130)

```
10 LET A  47 20 LET B = 1 30 LET C = SQR(A*A+
B*B) 40 LET C  VAL STR$ C 50 IF C  INT C = 0
THEN GOTO 100 60 LET B  B + 1 70 GOTO 30
100 PRINT "B  B C = "C 110 PRINT 130 LET X
= ACS(A/C) 120 LET X  X  180/PI 140 PRINT
BEARING FROM B  " X  DEGREES 150 STOP
```

By running this program we find that the only possible right angled triangle with unit sides of 47 1104 and 1105 units will have an angle of B of approximately 67 56 degrees

Winner of Puzzle No 90

The winner is P J Warburton Mayflower Drive Marford Wrexham Clwyd who receives £10





but seriously
AUTOMATA
PIMANIA
16K ZX81 £5 BBC 32K £10 Dragon 32 £10 Spectrum 48K £10
GROUCHO – the Pimania sequel Concord OE 2 USA prize
Spectrum 48K £10
PI-EYED – the comedy cartoon arcade game
Spectrum 48K £6
PI-BALLED
Spectrum 48K £6
MORRIS MEETS THE BIKERS
Any Spectrum £6
YAKZEE
Dragon 32 plus Spectrum 48K £5
GO TO JAIL – Play the game
THE PIMAN'S GREATEST HITS
24 HOUR CREDIT CARD HOTLINE 0705-735242
I ENCLOSE THE RIGHT MONEY, OR DEBIT MY ACCESS/VISA CARD
CARD NUMBER
MY SIGNATURE
MY NAME
MY ADDRESS
POST CODE
NO EXTRAS! ALL OUR PRICES INCLUDE DELIVERY AND V.A.T.
Send to AUTOMATA U.K. LTD
27 Highland Road Portsmouth, Hants. PO4 9QA
YOU MAY HAVE NOTICED THAT OVER RECENT WEEKS THE PIMAN HAS BEEN BLOWING OFF ABOUT HOW HE'S GOING TO TRAIN FOR THE OLYMPICS! WELL, IT LOOKS LIKE THIS TIME WE'RE REALLY GONNA SEE THE LITTLE SQUIRT IN ACTION!
EVANS
PUFF I USE A WEIGHTED BACKPACK - PANT WHEN JOGGING - GASP -
- BUT AUTOMATA HAD A NERVE, FILLING IT WITH SOFTWARE CONSIGNMENTS AND MAKING ME DELIVER THEM BY HAND TO THE * WHOLESALERS! PHEW!
* WHAT WHOLESALERS ?!?!
BACK HOME
YOU SHOULDN'T PUT YOUR FEET STRAIGHT INTO WATER AFTER JOGGING!
WHY, IS IT BAD FOR THE FEET, THEN?
NO IT'S BAD FOR THE SHOES YOU FORGOT TO TAKE 'EM OFF!
SAS TRAINING MANUAL TOP SECRET
LOOK, SHORTS, IF YOU WANNA GET REALLY FIT, FOLLOW THIS LITTLE TOME I PICKED UP TODAY!
S.A.S. INDEED! WHY NOT WORK OUT WITH JANE FONDA?
I'LL TRY A BIT OF BOTH
JANE FONDA'S WORKOUT RECORD
LATER
NOW THE LEFT LEG - IN KICK IN DOWN STRETCH GOOD NOW THE WHOLE BODY
KERSMASHK!
WAH!
WH WHAT'S YOUR GAME THEN?!
GRRR GRR
ALONG COMES MR PENFOLD
AAGHAH HARK
I POPPED BY TO SEE HOW THE TRAINING WAS GOING
SPECTRUM DISC DRIVE £250 PHONE PORTS 735242 FOR DETAILS!
EEAYK!
BONK
WELL, IF HE DOESN'T WIN ANY MEDALS HE'LL BE ABLE TO DO IN THE JUDGES
LATER STILL
HE'S BEEN WORKING OUT NON STOP IN THAT GYM HE INSTALLED IN THE SPARE ROOM! WE HAVEN'T SEEN HIM FOR AGES AND AGES!
HE MUST LOOK LIKE JOE DALLESANDRO BY NOW POOR SCHMUCK!
PI-MAN! Y-YOU'VE - YOUR NOSE - IT'S ALL
YEP! SOLID MUSCLE! CAN I PINCH SOME OF YOUR BABY OIL TO MAKE IT SHINY?
MORE ATHLETIC RUBBISH NEXT WEAK, FOLKS!